WHAT'S IN STOCK FOR YOU?

"PROFITING IN DIFFICULT TIMES"

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Saskatchewan Agriculture

Saskatchewan Livestock Association

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ACKNOWLEDGMENTS

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We would also like to thank our exhibitors whose displays and technical staff provided extra information to the farmers and ranchers attending.

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We thank all of you who came to **What's In Stock For You? 1986.** Its really your seminar and **you** helped make it a success with your participation. The 1986 seminar joins 1985, 1984 and 1983 as an outstanding success. Thank you.

The Organizing Committee

Al Hingston Livestock Branch, Saskatchewan Agriculture
Barry Peterson, Extension Services, Saskatchewan Agriculture
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Where complete papers were provided by the speaker to the proceedings editor, they have been printed here unedited, with the addition of questions and answers from the floor. If complete papers were not available, the editor used transcripts of the talk plus any material provided by the speaker. Every attempt was made to ensure accuracy and preserve the intent of what the speaker said, to the best of the editor's ability.

WELCOME TO "WHAT'S IN STOCK FOR YOU? 1986"
His Worship Mayor Larry Schneider
CITY OF REGINA

Good morning to each and every one of you! Welcome to the "Sweetwater Capital" of Canada. I wish you nothing but rain and grass.

As I read through the agenda, I'm reminded of some of my own experiences in the livestock business. "World Beef Trade and GATT". Once a group of us went to Korea to promote the sale of Saskatchewan breeding stock. We thought it would be a simple matter: we had the best cattle in the world, just knock on their door, tell them how to spell "Saskatchewan", address the envelope for their cheque and send them a plane load of cattle.

We went into a couple of factories and the Koreans knew where the world situation was at - they had their breed journals on their desks. They said "we'd like to buy your cattle but we need Canadian dollars, so you'll have to buy some of our products". They were working on jackets for the Chicago Police Force, Motorcycle Division - the kind of jackets that stand up on their own, and also a leather coat order for Germany.

About the same time we got home, so did Eugene Whelan from that round of GATT agreements which **restricted** imports from low-cost labour countries. We had a good time in Korea but didn't accomplish anything.

"U.S. Farm Policy and North American Beef Industry" reminds me of the Regina Bull Sale. As much as 25-30 percent of those bulls go south. I don't think its because of the dollar, though every year we spend a lot of money advertising "Your dollar buys a dollar-forty worth of Canadian Bull". One year we had an undeclared war with the Sheridon Country Stockmans Association, across the line in Montana. They didn't like our bulls going south, disrupting **their** market and I guess I don't blame them. A U.S. buyer who had bought six bulls at Regina cancelled his order because his customers no longer wanted Canadian bulls. So we took them ourselves to the auction in Williston and made $100.00! What sells bulls is the demand for the end product - meat! There was no **difference** between the U.S. breeding stock market and the Regina bull sale market.

"Red Meat Mythology" - I saw a bumper sticker that said **Support Beef Consumption - Kill a Chicken.** I've been on the rubber chicken circuit for years, went to see my doctor who told me to stay away from animal fats, my very own doctor! The swing of the masses, the tastes, the medical advice, the trendy food fashions certainly keep the subject a topical one. Lets tell the facts to the consumer!

And lets improve our marketing! A guy knocked on my door to tell me of his new Winnipeg company selling packaged products such as Chicken Kiev. We still sell hamburger by the pound, a great negative because everyone can remember the price 10 years ago and wants to know why the change. McDonald's can raise the price of their hamburger and it's part of life. We should sell "by the serving".

"Effect of Cow Size on Cow Efficiency" - one of the Cattlemen here just told me his winning 4-H calf is first on the truck because it won't contribute to his cow herd. Depending on your geography and purpose for which you raise those calves, the outcome of Dr. Ritchie's session may mean different things to different people.

With that, I wish you all a very good session in the City of Regina and give you my most sincere welcome to the city and hope you have the opportunity to come back to our community again, soon.

"MANAGING RISK IN A CHANGING ENVIRONMENT"

Charlie Gracey
Executive Vice-President
Canadian Cattleman's Association

There's nothing new about risk. It's scarcely a revelation to you livestock producers that livestock production and livestock markets are fraught with much risk. What is different today, vastly different, is the fact that risk has intensified a very good deal in recent years and at the same time as risk has intensified, the margin for error has narrowed alarmingly.

Reality and Causes of Risk

Let me deal with reality first. The first step in managing risk, in my view, is to recognize and accept reality as it is. Nothing is gained by dreaming about a world that is not and cannot be. I have a close cattleman friend in Ontario. Every time he comes in we have a huge argument about supply management. He believes it's the solution for beef industry problems. I finally reached a truce of sorts by telling him, "Bill, you believe in support and supply management as the answer to industry problems just as strongly as I oppose them. The advice I have for you is to run your operation in the real world. Run your operation as though it weren't going to happen, because it's not going to happen in time to solve the problems that you feel you have."

The advocates of parity pricing are equally well advised to recognize that their dream is a long, difficult and impossible shot. So, too, are the beliefs of others who believe that the Canadian livestock industry can insulate itself from the world market realities and the imperatives of international trade. Most deceived of all may be those who persist in believing that governments have the resources to constantly make up the shortfall between market returns and producer expectations. The sheer size of federal and provincial deficits will eventually dictate a retreat from even current levels of support. **The idea of government managing our risk for us is unrealistic.**

The causes of risk in livestock production lies in the fact that livestock production, particularly pork and beef production, and most particularly, in about the last decade, has changed irreversibly from an essentially domestic market and industry to an international commodity. We have always accepted the North American character of the market insofar as livestock production is concerned, and we must now learn to accept the international character of the market.

What happens in the European Economic Community impacts on our industry both directly and indirectly. The direct impact of export subsidized product entering our market is well understood by all of you. But, when the EEC forces Australia and New Zealand out of third world markets, out of the Middle East and out of Pacific Rim countries, that results in increased supplies of Australian and New Zealand beef on world trade channels and depresses our price indirectly. **Our commodity is an international community!** Perhaps the single, compelling fact about western hemisphere agriculture is excess production and excess capacity. Presently, this excess productive capacity is centered primarily on grain and declining export market opportunities. This reality, briefly described, creates an enormous element of risk for our livestock industry. In North America, I would describe our meat market as a saturated market. In the United States and Canada in 1985 we reached and held record levels of total meat consumption. In the United States, about 200 lbs. of meat consumption per capita per year and in Canada about 210.

A lot of Cattlemen are concerned and a little mystified as to why we haven't got a market kick, out of the reduced cow numbers. When we've reduced our cow numbers 27 percent or so from their highs we should have had a stronger price response in the market place. The reason we haven't, unfortunately, lies in recognizing the fact that it isn't just the supply of beef that determines the price of beef but the supply of total competitive meats.

Furthermore, the heavy supplies of grain in western agriculture create for us the additional risk that despite the saturated meat market we will see a further increase in meat production, particularly, because we can do it more quickly, in pork and poultry. And that will bear down somewhat negatively on the demand side. These are realities that we must face squarely.

Much of the risk we encounter in our industry is policy-inspired. The common agricultural policies of the European Economic Community were framed with the best possible intentions, food self-sufficiency. That they resulted in massive and unmanageable surpluses was neither predicted nor intended.

Back in the mid 1970's, Ireland joined the EEC because there was a massive untapped market for their beef in the community. Today the community (EC) doesn't want one pound of Irish beef and we are recipients of that product.

How quickly policy changed that circumstance. The policies of provincial self-sufficient, provincial self-support programs and the like, are rapidly leading us in the same direction in Canada. The first warning was the U.S. countervail action against Canadian hogs and pork. The same thing can potentially happen to the cattle industry.

Enough on the policy issues. Of more immediate interest and concern to individual producers is individual risk management in this new, more complex, and more uncertain environment. If risk exists, - and it surely does, we must learn to manage it or be managed by it. Or be its victim.

Risk Management Tools and Techniques

Market Forecasts are **NOT** a good risk management tool. The reason is that market forecasters cannot foretell the future with sufficient accuracy for you to make basic decisions.

There is in Canada a small family of market analysts or market forecasters, people like Chris Mills who writes in Grainews, Bill Grey who appears frequently in Cattlemen, Al Bozwell of Agriculture Canada, myself and a few others. We did not predict the market collapse in the second and third quarter of 1985 and neither did any one south of the border predict it.

That little family of market forecasters, Mills, Bozwell, Grey and Gracey, are profoundly gifted in being able to explain after the fact why we were wrong and why it wasn't our fault. Who knew that the retailers were going to keep their margins high? Who knew that there was going to be a drought in western Canada? Who knew that we were going to kill 67 percent as many heifers as steers? Who knew that we were going to kill 18 percent of our cows instead of 13 percent? "I didn't know those things, so I'm not to blame," but, the bottom line is "**That's no good to you.**"

It has taken us a long time to learn that we can't make price forecasts with precision. We can make reasonably accurate supply forecasts. We've had the same kind of experience with supply as price and we've found that market analysts who attend to their business can make fairly accurate supply forecast and out of those supply forecasts can come some **intimations** about the **direction** of price.

Public policy instruments, such as tripartite stabilization and provincial programs have become, like it or not, a part of our industry. Stabilization programs were designed as a price insurance and for that reason a risk

management tool.

The tripartite stabilization program is a very simple one indeed. It will undertake to guarantee a support price for cow-calf production at 85 percent of the previous 10 years average when that 10 year average price is adjusted for inflation for a producer premium, of about eight dollars per cow enrolled. My calculations are that the support level for 1986 will be very close to $ 4.70 a hundred weight. No one pretends that this price of $84.70 is anywhere near a break even price for cow-calf production. It is a stop loss price that the public is prepared to underwrite. Producers are free in provinces that are signatories to decide whether they wish to join the program or not.

The slaughter program, in return for a producer premium of somewhere between 62 and 70 cents a hundred weight, will undertake to cover the cash cost of feedlot production plus half of the margin between cash cost and prices actually realized in each of the previous five years. The program is quarterly. Prices, costs, and margins will be calculated on a quarterly basis.

The **future market** and **options market** are more market-oriented risk management instruments which are attracting attention and much interest. I'm not going to explain in detail how the options market works. I hope to raise your awareness of the existence of these techniques and peak your interest in them.

Future trading has been a disappointment in Canada. Futures hedging can be a positive and effective tool when properly employed, but it has many problems. The first problem is that futures are traded in the U.S. market, delivery is virtually impossible and basis risk can be severe. The second problem is that futures markets can insure a price floor but they also deliver a price ceiling. In fact, once cattle are hedged, you are locked in a price channel below and above which you cannot escape. A third problem is the very human problem where well intended hedgers quickly become speculators. If we totalled up the net returns to hedging, or, what you thought was hedging over the last five to ten years in this country, the total would be probably many millions of dollars in the negative. Farms have been lost by people who thought they were hedging, but were in fact speculating.

Recognizing some of the inherent problems with the futures market, the Chicago Mercantile Exchange, about 18 months ago, introduced livestock options which are a form of price insurance which carry less risk than the futures market. I'll explain the basics and leave you with the idea. Your livestock specialist and/or your bankers can help you with the details.

Options work this way. If I guaranteed you $78. for August cattle, most of you cattle feeders would rightly reject my offer. I can safely guarantee that price ($78/cwt) using the futures market. But, if I offered you a guarantee of $73/cwt A1, A2 steers Saskatchewan price as the **lowest, minimum** price for August steers, with the upside of the market yours to take, and at a lower cost to you than futures, I might have some takers.

The minute I guarantee you the minimum price of $73., I enter the market (as your agent) and buy a **put option** at a strike price of $60. A **put option** confers upon me the right to sell the futures at $60. anytime between now and the expiry date of the option. It costs $2.85 to do that, so my support price is $60 minus $2.85/the Canadian dollar, (about .7) minus $8., the normal basis between Saskatchewan and Omaha when you convert the money. The 64 cents is my commission.

(($60.00-$2.85)/0.7) - $8.00 = $73.64

Now lets suppose the U.S. market drops to $60. Your Saskatchewan cattle are worth $63. with the $8. basis. I guarantee you $73. so I'm out $10. Now I exercise my option, my right to **sell**

futures at $60. and buy back at $50. There's my $10. The options market gives you a floor but lets the ceiling rise. For example, the U.S. market goes to $75. Your Saskatchewan cattle at minus $8. basis are now worth $99. I don't give you $73. and pocket $26. I guaranteed you a floor. You get the $99. minus the options premium you paid of $2.85.

Let's assume the U.S. market falls to $50. or rises to $75. with a 70¢/ Canadian dollar and a minus $10. to minus $6. basis. The unprotected man in the cash market has Saskatchewan cattle worth $61-$65. if the US. price drops to $50.; or worth $97-101. if the US. price rises to $75. The man who has hedged cattle at $60. for August has locked in $76. to $80. which is better than $61-$65. if the US. price falls, but not as good as $97-$101. if the U.S. price rises to $75. The futures market shuts off the bottom and the top. The man who has bought options at $60. for August cattle only locked in $71-$75. on the bottom but can rise with the market to $94-$98.

These are the techniques of options trading. They do get somewhat more sophisticated than that but it is enough to introduce you to the topic. There will be and there are people quite familiar with the program, beef specialists, district agriculturists, bankers. These are effective risk management tools. You cannot afford not to become familiar with these devices. A growing number of Cattlemen are employing these techniques and risk will be increased for those who don't.

I put my money where my mouth is, because I can't predict the future. I don't like the thought of the Canadian dollar rising. If the dollar rises, inventory value of cattle will decline nearly dollar for dollar with the rise. So I bought a **call option** on the Canadian dollar with a strike price of 73¢. It cost me $125. (U.S.) on $50,000. (Can.). If the dollar drops I don't mind, the commodity value goes up and if the dollar rises past 73¢ I get my money back. I don't believe it will rise but it's a risk I can cheaply cover myself against, using options.

I was asked to speak about risk management in an uncertain environment. I've endeavoured to talk about things that can be done in terms of attitude, i.e. in accepting reality for what it is; in terms of the judicious employment of public policy, if you choose, and in terms of employing some of the real market instruments that have been created and improved for your use.

QUESTIONS AND ANSWERS

QUESTION: Do packers and retailers work on a daily or weekly basis or do they lock in their supplies at a definite price into the future?

ANSWER: Some are starting to lock in supply and price. IBP are offering to buy fed cattle in western Canada at a price related to the futures price. With declining cattle numbers and plant over-capacity we are going to see more interest in secure access of supply. For example, they may guarantee, using my example, $73. and 95 percent of any price rise.

QUESTION: The options market seems to be very feasible for slaughter cattle; is there anything similar for someone selling calves?

ANSWER: There is not an options market for feeder cattle. You could, since they tend to run parallel, cover a risk in falling feeder prices by covering a drop in fed cattle. It's not a good answer. As I see it, over the next few years the feeder market will be a **sellers** market, with much less risk than a feedlot. Especially if we start to rebuild the cow herd and stop marketing feeder heifers at the rate we are now there will be a sharp decline in feeder numbers.

QUESTION: Doesn't the EEC have to take Ireland's beef, the same as anyone elses?

ANSWER: EEC must trade beef back and forth but as a block they have 900,000 metric tonnes of surplus beef (equivalent to 95 percent of our production) and it doesn't matter if its Irish or French. In 1974 there was a demand pull for Irish beef into France, but not today.

QUESTION: What about Mexico, Central and South American beef?

ANSWER: The only one we trade with is Nicaragua and only about three million lbs.

QUESTION: Why don't Beef Stabilization Boards use options to defray some of their high payouts?

ANSWER: The answer I got from the Ontario government was it is probably illegal for a government to engage in futures or options trading. But for example, your Saskatchewan Board may be able to act as a clearing house or agency so you could cover the dollar. We need a clearing house to be able to explain it to the average guy who is busy trying to produce cattle. Someone who won't lose interest in you, like your broker if you call him three times and don't order.

QUESTION: How much beef coming into our country is subsidized?

ANSWER: All of it.

QUESTION: And we wonder why our cows and heifers go to market. How long before we don't have any left in Canada?

ANSWER: Exactly. We understand that we have a countervail case against the EEC. All of it's subsidized, not only in production but in export refunds, as well. Production subsidies, packing plant subsidies, wrapping material subsidies, storage subsidies and export subsidies; when you add all those up, they approach the value of the product. We think that should be instantly countervailable. But now we have to prove that they're subsidizing; we have to prove that it's injuring our market. This is more difficult to prove than you or I would believe.

When European beef enters our market and depresses our price, it cannot depress our price below the export floor. What the Europeans are cleverly doing is accessing the U.S. market through the back door. The Americans have already said to us by letter that if you guys can't control subsidized imports into Canada at the same rate that we do, we may have to countervail you. If the Americans close the border, then we'd find out exactly what the dimensions of the injury were. As long as we're a pass-through, the stuff just flows through our market and there is no additional injury.

QUESTION: How will use of the options market work if the border is closed?

ANSWER: The options market or futures market will only work as long as we have a totally open border. The basis or relationship between the two markets would be destroyed.

QUESTION: Why does Canada not have the same protection against EEC beef as the U.S. does?

ANSWER: In 1979 GATT negotiations, the U.S. got access to the EEC market for **high quality** beef for restaurants; in return they accepted 5,000 tonnes of EEC export subsidized beef. Our negotiators did not see Europe as a threat and didn't negotiate a deal. In 1985, we accepted 23.5 million pounds of EEC beef, 20 times as much as the U.S. on a per capita basis; in 1984 it was 40 times as much and they think we are excessively restrictive. There are two issues - placate the Europeans or negotiate free trade in beef with the U.S. It's in our vital interest to do the latter.

WORLD BEEF TRADE AND GATT AGREEMENTS

Gordon Pugh
Commodity Market Analyst
Royal Bank of Canada
Winnipeg, Manitoba

This paper will make some comments on world beef trade and particularly on international trade issues facing Canadian cattlemen.

Importance of Trade to Beef Industry

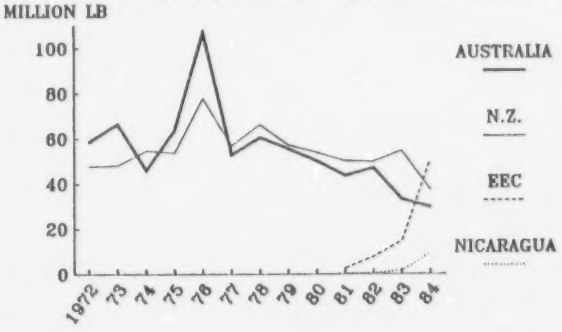
I would like to preface my remarks with just a few general comments on the importance of trade to Canadian cattle producers and, therefore, why I believe that you should be keenly interested in the trade policy matters. For better or worse, developments in these issues are going to affect your competitive position in the Canadian, the North American and "off-shore" markets.

The importation and exploration of cattle, calves, beef and by-products have been important aspects of the Canadian beef industries for many years. And that importance has multiplied in the last ten years. As regards exports for example, I guesstimate that in the late 1950's, abut $1. in $12 that a Canadian cattle producer earned was dependent either directly or indirectly on the sale of cattle, calves, beef and by-products in foreign markets. In 1985, however, I estimate that about $1. in six or seven was derived in this manner. Moreover, it is quite clear that Western Canadian cattlemen and particularly you in Saskatchewan are more dependent on exports than are those in other parts of the country.

Canada is also a major importer of cattle and beef products (Figure 1). Since 1975 imported beef has regularly accounted for eight percent of Canadian beef consumption. More important, however, is that imported beef is accounting for an increased proportion of our "low-grade" or manufacturing-quality beef consumption. Up until about 1981 that share was about 25 percent, but in 1984 it was 42 percent. This increased proportion resulted from the importation of subsidized beef from the E.E.C. (Ireland and Denmark).

FIGURE 1:

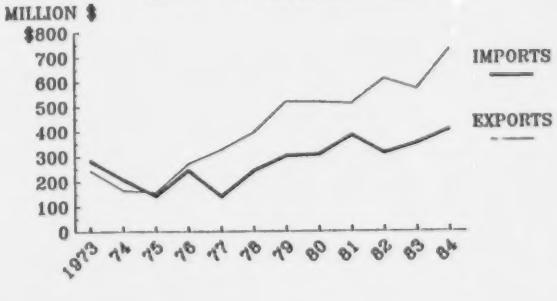
CANADIAN IMPORTS OF BEEF AND VEAL FROM "OFFSHORE"



As a final point you may be interested to note that Canada, in dollar terms, is actually a major net exporter of cattle and beef products. Between 1975 and 1985 our exports increased by over four-and-a-half times, totalling about $800 million in 1985 (Figure 2). During that same period our imports increased by only about two and a half times, totalling about $425 million in 1985. Consequently we registered a trade surplus of about $375 million in 1985.

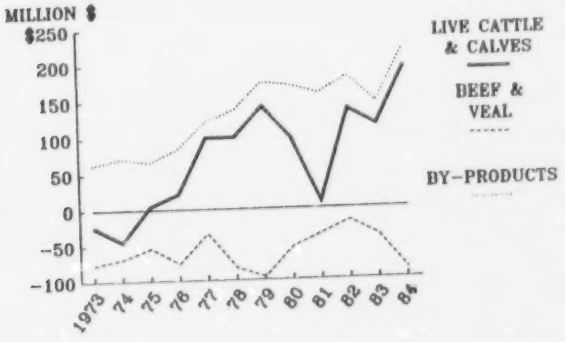
FIGURE 2:

CANADIAN TRADE IN CATTLE, CALVES, BEEF, VEAL AND BY-PRODUCTS



There is no question that this was a major contributor to Canada's favourable trade balance in 1985 and, therefore, to the health of the general economy (Figure 3).

FIGURE 3:
CANADIAN BALANCE OF TRADE



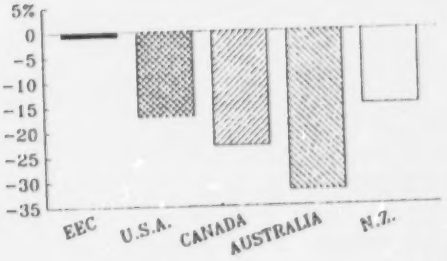
As a lead into a discussion of current trade issues facing the Canadian beef industry I would like to briefly review with you the current situation in international beef markets and the reasons why they are so screwed up.

As I've just pointed out Canada has become increasingly involved in international beef markets these last 10 years. Unfortunately Canada's increased exposure has coincided with a period of increased instability in world markets. In particular since 1981 world beef trade has been increasingly disrupted by the international policies and trading practices of the EEC.

While the world beef market was large enough to absorb the EEC's surplus production and while those surpluses where under some semblance of control their effect on world markets was restrained. However, since 1981, the world beef market has shrunk and the EEC's surplus beef production has gotten out of control.

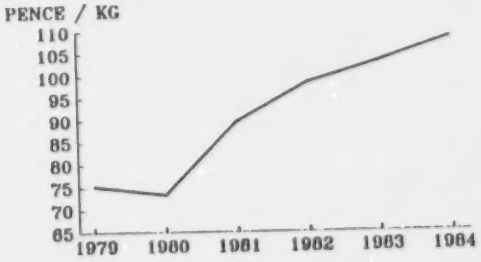
The problem basically got started in the mid-70's. At that time you may recall that here in Canada we experienced a sharp decrease in beef demand and a sharp increase in beef supplies and therefore low cattle prices. This was a world wide phenomenon. Australian, New Zealand, Canadian and U.S. cattlemen responded by cutting back on cattle numbers (Figure 4). By the late 1970's cattle numbers and beef production had been sufficiently reduced to permit beef prices to recover.

FIGURE 4:
DECREASE IN THE SIZE OF CATTLE HERDS BETWEEN 1975 & 1985



In the EEC, however, the supply crisis of the mid-1970's was never successfully resolved. The reason for this was that EEC authorities intervened massively in the market in order to support prices and to prevent, therefore, the downward adjustments in cattle numbers which should have occurred. Unfortunately, however, the protection from imports and price support policies which were introduced were of such a magnitude as a result in significantly higher cattle and beef prices (despite increasing production). The situation in Ireland reflects the EEC situation. Between 1980 and 1984 average cattle prices in Ireland rose by over 30 percent (Figure 5).

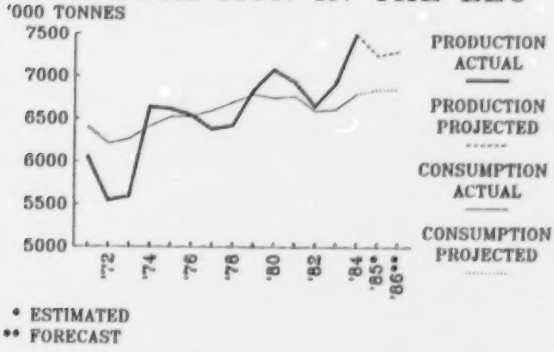
FIGURE 5:
AVERAGE ANNUAL CATTLE PRICES IN IRELAND



The distortion of market prices in the EEC has had predictable consequences. Firstly it has sharply stimulated production and secondly it has severely restrained consumption (Figure 6.)

FIGURE 6:

BEEF PRODUCTION AND CONSUMPTION IN THE EEC

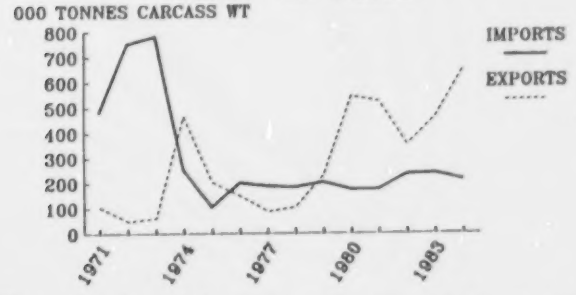


* ESTIMATED
** FORECAST

Further, of course the growing internal market disequilibrium resulted in major changes in the EEC's trading position: imports decreased and exports increased. Indeed from the early 1970's to the early 1980's the EEC transformed itself from the world's largest net importer of beef to the world's largest net exporter (Figure 7).

FIGURE 7:

THE EEC'S IMPORTS & EXPORTS OF FRESH, CHILLED & FROZEN BEEF & VEAL

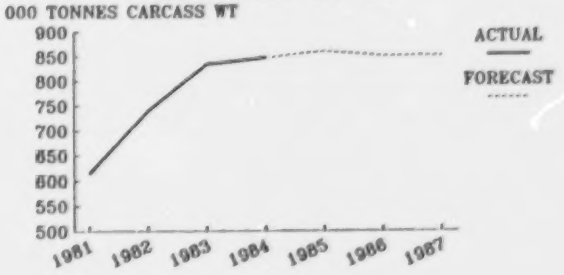


The growing imbalance in the EEC's beef market did not impact too negatively on world beef markets as long as world markets were large enough to absorb EEC surpluses. Since 1981, however, the demand for beef in the EEC's traditional outlets became much less buoyant and, secondly, the growth of production in the EEC has accelerated.

Firstly one would note that roughly 3/4 of the EEC's beef exports go to the Soviet Union and to countries in North Africa and the Middle East. It should be no surprise to learn that growth of imports of beef by Middle Eastern and North African countries basically halted in 1983. As oil prices have decreased, their ability to import has decreased. And based on the outlook for oil prices future growth of imports is unlikely (Figure 8).

FIGURE 8:

BEEF IMPORTS BY NORTH AFRICA AND THE MIDDLE EAST



The reduction in demand for beef imports by the USSR has been even more marked (Table 1).

TABLE 1:

BEEF IMPORTS BY THE SOVIET UNION (000 tonnes, product weight)	
1981	452
1982	400
1983	335
1984	300
1985	275
1986	250
1987	225

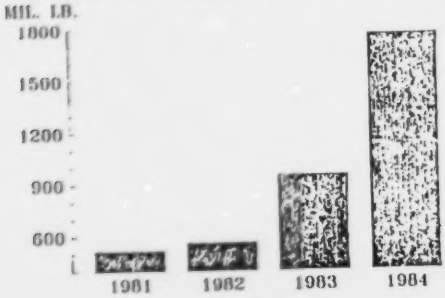
Moreover as its major export markets shrunk in size, and as its production grew the EEC began accumulating huge surpluses of beef in publically-owned storage stocks totaled about 2 billion lb. (roughly ten percent more than Canadian beef production last year) (Figure 9). Most of these stocks will be disposed of on export markets.

In view of the reduced market outlets and growing surpluses it is not

surprising that the EEC began looking for new export markets. Given that the Canadian market was, for all practical purposes, open it was not surprising either that our imports from the EEC became so large. From virtually nothing prior to 1981 our imports from the EEC grew to approximately 50 million lb. in 1984 and would have reached 70-80 million lb. in 1985 had not import controls been invoked.

FIGURE 9:

STOCKS OF BEEF IN COLD STORAGE IN THE EEC



It is clear, moreover, that the EEC would be unable to export beef to Canada if substantial export subsidies were not accorded to beef exports. Export subsidies permit EEC exporters to undercut domestic beef prices and those of other exporters.

The negative effects of these subsidized imports on our cattle/beef market can be summarized as follows:

1) Canadian cattle prices, particularly those for slaughter cows are depressed (by an estimated $2-$3 per lb. in 1984);

2) Our traditional suppliers (Australia and New Zealand) are displaced;

3) Canadian cattle and beef are effectively displaced into the U.S. market, this irritates U.S. cattlemen and jeopardizes our position in that market.

The GATT and World Beef Trade

The GATT is an international treaty signed in the late 1940's by some 30-odd countries with the objective of creating a better world trading environment. The GATT has three principal functions:

1) It sets out a number of rules as to how international trade should be conducted;

2) It provides for settlement of trade disputes between countries;

3) It says that countries will meet on an on-going basis to reduce trade barriers.

Today there are 90 countries which have signed the GATT. The GATT organization is headquartered in Geneva, Switzerland.

Up until the mid-70's as I said world trade in beef and beef products was relatively problem-free. The only major barriers to trade had been tariffs and GATT had been quite successful in having these reduced up to virtually meaningless levels. However, the GATT has proven ineffectual in controlling, since the mid-70's, the growing problem of excessive domestic and export subsidization to which I've referred. Indeed GATT rules explicitly exclude agricultural products from a general ban on export subsidization. Neither are there any specific rules as to what extent and in what manner governments can subsidize their agricultural industries.

However, we are now being given a new opportunity with GATT to do something about subsidized exports. A new round of GATT negotiations should get started late this year or early next. Canada's primary objective as regards agriculture trade is to have some type of control placed on subsidization of agricultural trade.

Hopefully, however, Canadian cattleman themselves will have removed this threat long before GATT negotiations are completed or perhaps before they are even started. The Canadian Cattleman's Association has launched

what is called a "countervailing duty" action against EEC beef.

The CCA's CVD Action against the EEC

GATT rules permit a country to have laws under which a tariff, or tax can be applied on imported product if producers of that product in the importing country can prove:

1) That the imported product is subsidized, and

2) That they are being "injured" by the imported products.

The tariff is called a "countervailing duty" and is equal to the amount by which the imported product is subsidized.

The countervailing duty procedure is a fairly complicated one. It requires firstly that producers or their representatives formally request the Department of Revenue to initiate an investigation of the imports concerned with the object of applying a CVD. The request must be accompanied by documentation providing circumstantial evidence that the imported goods in question are subsidized and are injuring Canadian producers. If Revenue Canada accepts this evidence an investigation is launched. There are two investigation periods: the first, which is normally 90 days, is carried out by Revenue Canada. It is to estimate the amount of subsidy being applied on the imported goods. At the end of the first investigation a CVD is applied on a provisional basis pending the outcome of the final investigations, one by Revenue Canada to put a final number on the amount of subsidy and the second by what is called the "Canadian Import Tribunal (CIT)" to determine if Canadian producers have been injured by the imported product. If the CIT determines that injury has occurred the provisional CVD is applied permanently.

In September 1985 the Canadian Cattlemen's Association (CCA) requested Revenue Canada to launch an investigation of beef imports from the EEC. Revenue Canada accepted this request and launched an investigation in October.

At the present time, in practical terms, we are between the two investigation periods, the EEC has offered to restrain its exports to Canada at a level of 10,668 metric tons (23.5 million lb.) on an ongoing basis. This offer was made in order to head off a final investigation. If this proves unacceptable to CCA, Revenue Canada will impose provisional CVD's and the final investigation will proceed. We should know within a couple of weeks what will happen.

Should the final investigation proceed, it will last until about mid-June.

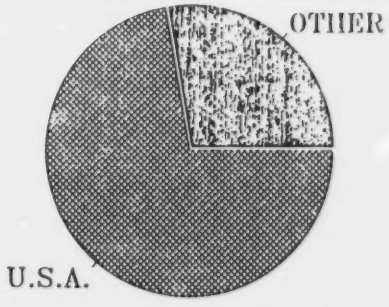
Importance of Canadian-U.S. Beef Trade

As a concluding comment I would like to briefly describe the importance to Canada of our trading relationship with the U.S.

As I said at the beginning of the talk we registered a $375 million surplus in trade in cattle, calves, beef and by-products in 1984. It should be emphasized, however, that 73 percent ($237 million of that surplus was in trade with the U.S.A.) (Figure 10).

FIGURE 10:

CANADA'S 1984 NET EXPORTS



Moreover the surplus in trade with the U.S. has grown sharply since the mid-70's. Our 1984 surplus was almost twice as large as that in the mid-70's for example. By category we export

more to the U.S. than we import from there in every category except for by-products (Figure 11).

FIGURE 11:

CANADA'S TRADE WITH THE UNITED STATES

In 1984 our trade with the U.S. by category was as follows:

1) cattle and calves:

   exports: 375,000 head valued at $222 million.
   imports: 40,000 head valued at $35 million.

2) beef and veal:

   exports: 161 million lb. worth $178 million.
   imports: 41 million lb. worth $112 million.

3) by-products (offal, tallow and raw hides):

   exports: $47 million.
   imports: $63 million.

My only point in summarizing this data is to underscore the vital importance to Canadian cattlemen of the U.S. market. The importance of continued free access to the U.S. should be obvious.

QUESTIONS AND ANSWERS

QUESTION: When we talked about the sacrificing blueberries and maple syrup for beef, was it really dollars or is it some sort of regional problem as to where the products come from?

ANSWER: The situation you're referring to is when we activated our meat import law, in December of 1984. The Minister of Agriculture announced that the meat import law was going to be imposed for 1985 and announced about two and a half thousand tons of quota for the EEC. The Europeans came back and said "If you don't increase it or give us a fair share, we're going to retaliate by cutting off or removing tariff concessions such that you would lose $40 million of exports to us on things such as blueberries, maple syrup, whiskey and shoes."

I have to take it at face value that in fact we would have lost $50 million worth of exports of those products. But, I have to say though that the Europeans were quite slick in determining such a range of products which would hit each region of Canada quite significantly and, of course, Quebec, particularly. They not only hit us with a threat significant in dollar terms but in political terms.

It was viewed from a governmental point of view that the initial offer of two and a half thousand tons to the Europeans was an initial negotiating position. There was some amazement at the size of the threat of retaliation, but we had been prepared to go up higher anyway. First of all, the Europeans were well within their rights to demand some type of compensation, on the basis of which quotas were invoked. Secondly, we held the position that at 23 and a half million pounds or 11,000 tons, the Europeans were held to a level which was half the level of imports they had had in the previous year, 1984, and was about a third to a quarter of what we thought they would have imported without any type of control at all.

QUESTION: We have a surplus of trade in dollars of beef, what is our balance of trade in tonnage?

ANSWER: If I recollect correctly, that for 1985 we had a positive balance of trade in beef of about 75 to 100 million pounds. We had a surplus on

live cattle trade of about 250,000 head in 1985. The live cattle trade is not quite as clear a benefit because the 50,000 or so we import are almost 100 percent fed steers, primarily into Toronto. What we export is almost exclusively slaughter cows and feeder cattle. Something we should watch for in the next few months as our dollar sags is increasing exports of fed cattle out of southern Alberta into, particularly Washington state. Primarily, we're exporting lower quality, lower valued animals, importing higher value animals so that surplus in the live cattle trade isn't quite reflected proportionally.

QUESTION: If what you say is right, if anything happened to our access to the U.S. market, it would be more devastating than what Europe is going to us?

ANSWER: We'd be dead. We just guesstimate, on the cow market alone, that if we lost our access to the U.S. market, we'd see a decline in cow prices in the neighbourhood of about 25 percent overnight. That would be reflected down the line in fed cattle, immediately probably 10 - 15 percent but on an ongoing basis, much more.

QUESTION: What about our by-product trade?

ANSWER: We are huge net exporters of by-products primarily. We export over three-quarters of our production of tallow and hides to Europe, Italy, South Korea, Hong Kong and we reimport the hides as shoes and belts and coats in about two months from the time we export them.

We are after the United States the number one supplier of those products to Europe. Our exports of offals, hides and tallow, have increased by about five-fold in dollar terms since the early 1970's. However, that trade, at least the offals trade, primarily liver and tripe is in jeopardy because the Europeans have just introduced a law, for their domestic market which bans the use of growth promotants, hormones, synthetic or natural. Within two years that is going to apply to imported product as well as to the domestic product. I wouldn't say it's 100 percent certain, but we certainly are in jeopardy of losing that market for our offals.

The by-product value on fed cattle at the moment is around about $10. a hundred. So, roughly 15 percent of the value of a slaughter animal marketing today is directly related to by-product value and that by-product value, in turn, let's say is 50 percent related to the value of by-products, particularly offals, which are shipped into Europe. I don't think that that is an insignificant fact.

QUESTION: How long do you think the money supply can last for the production and export of cattle in the EEC?

ANSWER: It's a problem which the Europeans are facing right now. There are maximum limits to the size of the Treasury there. The size of the Treasury, though is still huge. Their 1985 agricultural subsidies amounted to about $26 billion and that works out to about, in my guesstimate, $25,999. per farmer in the European community. But, my feeling is, that the Europeans, while they might reduce the amount of subsidization to the producers within their own country, are not going to reduce the amount of subsidization on the export of agricultural products. Their beef price support system called the Beef Intervention System supports prices to their producers and therefore keeps the beef producers incomes up, by taking beef off the wholesale market and putting it into cold storage for a minimum of six months. That has come to be a very, very expensive process. Not only do they have to buy the product in the first place and finance its storage cost just in interest, but they have to pay the actual physical cost of storage. Some of this stuff by the way, has been in storage for three and a half years. It suffers quality deterioration as you can imagine. So, they have to sell it as lower quality

product on the market and therefore take a loss vis a vis its purchase price. Ultimately most of that stuff which is in storage is exported anyway with the aid of export subsidies. It's much cheaper to export the stuff right off the kill line. Kill it, bone it, freeze it, export it with the aid of export subsidies and you achieve the same effect as they were with this Beef Intervention System. While they may reduce their expenditures on that Beef Intervention System, at least a proportion of that money will be transferred over to export subsidies. Therefore, although the total amount of expenditure on total market subsidization may decline or stay the same, the effect on exports will increase and therefore the effect on the international markets, not just for cattle but for grains will increase.

QUESTION: I was hoping that it would dry up a bit. There's enough dollars there that that won't happen?

ANSWER: Yes. Their agricultural subsidies are financed with a value added tax in Europe which is equivalent to our sales tax. Member governments of the EEC are committed to paying one and a half percent of their sales tax revenue to the European community to pay for these agricultural subsidy programs. That used to be one percent up until three years go. There's some discussions now whether that should be increased to one and three-quarters. I would not underestimate the ability of the Europeans to find funds to continue to subsidize. I think they'll come up with the money to keep their level of subsidy very high.

READING THE BEEF MARKET

Bill Grey, Market Analyst
Royal Bank of Canada

I would like to attack today's theme of reading the beef market by looking at three specific markets: the fat cattle market, the feed grain market and the feeder cattle market.

1. **Fat Cattle Market:** In the short run (1986) there is going to be very little change in **demand** for beef so lets look at the supply side and **cyclical fluctuations** in supply. Figure 1 is a chart outlining the Canadian beef cow population at July 1 from 1970 to 1985. Our numbers peaked in 1975 and have dropped off rapidly since. You would expect to see slaughter supplies drop as well but as Figure 2 shows, that is not the case. The total federally inspected (F.I.) cattle kill in Canada peaked in the mid 70's (1975-1978) but since then has remained fairly stable.

   Why? Because Canadian producers along with their American counterparts are reluctant to hang on to females. Canadian Federally Inspected Heifer Slaughter (Figure 3) shows total numbers: 500,000 to 600,000 head in the early 70's, increasing rapidly to over 1.1 million head in 1977, during the big sell off and leveling off at around 900,000 head ever since.

   However, if we look at heifer kill as a percent of total kill (Figure 4), we can see it is very high. Of every 100 animals slaughtered in 1985, 29 of them were heifers. In the early 1970's during the herd building stages it was more like 21.

   Cow slaughter has further added to the total Canadian slaughter (Figure 5). Obviously, you fellows haven't been too enamoured with the calf market the last few years but some of the cow slaughter would have to be attributed to the drought in Western Canada as well. We had the massive sell off in the mid 1970's, bottomed out in 1979 and then came the high interest rates, higher grain prices of the 80's. People became reluctant to hang on to cows.

   Measured as a percent of total slaughter (Figure 6) cow kills are very high - in 1985 at record levels - 25 out of every 100 slaughter animals was a cow. When they are combined, heifers and cows, into total female kill as a percent of total (Figure 7) you can see that about 53 of every 100 animals slaughtered in Canada in 1985 was female. Record high levels.

   There are not only cyclical fluctuations over the years. There are also variations within a given year. As a thumb rule, if our weekly slaughter volumes in Canada are 63-65,000 that is normal. Above 70,000, we are in trouble; below 60,000, the market is very volatile. As a Market Analyst this is what I look for (Figure 8). The weekly Canadian Cattle Slaughter (my estimate), shows that in the first part of this year we are killing the last of the 1984 calf crop and the 1985 gradually starts coming to market. The lowest weekly slaughter numbers occur at the transition period in March and April.

   Any time numbers get down to 55,000 per week there is real price action in the market. Combine that with the second quarter (BBQ season) increase in demand for beef and price holds fairly good, even though supplies are back up again.

   However, in the third and fourth quarter, if we kill 65-70,000 head

. . . 16

like we did in 1985 and don't have that surge in demand that's when we run into price trouble. My advice, in terms of risk management, is stay out of the second half of the year.

2. **Feed Grains Market:** Demand is a given - we have a certain number of cattle we are going to feed in Western Canada and they'll consume a certain amount of feed. The real fluctuation is in supply of feed grain. We are unique in Western Canada. We are pushed around by the international market but we also have our own internal market on the prairies which may be quite different from the international market.

   We have extremes, where barley is selling well below the Board price, at Board price less elevation or even at a premium to Board price. The important thing is the wide fluctuations that we can get.

3. **Feeder Cattle Market:** The price you are paid for your feeders is almost totally dependent on the other two markets: fat cattle prices and feed grain prices. So when I try to forecast feeder prices I have to look very closely at these two previous factors. The supply of feeder cattle is in your hands.

   Oddly enough, when prices escalate, people don't sell. They hang on to heifers for breeding. The key to this market, right now, is to get those female numbers down to reasonable levels. What will that take? First, we need to get over the drought so you aren't forced to sell. Second, reduced feed grain prices will keep people bidding up the feeder prices.

   This fall (1986) we'll see a reduction in cow slaughter and as total beef supply drops a bit, beef prices will be driven up a bit. People can afford to bid more for your calves. You like that so you start to hang on to your cows and heifers. We could be in a very explosive position here, starting this fall. I don't think we can drive finished prices that much higher, maybe 90 cents Toronto on a regular basis but there is no reason calves can't go to $1.25 if the crop is good here on the Prairies.

   I can see feed grain prices following even further, which with stable or higher finished prices, could kick the whole mechanism off. The key will be to stop this forced liquidation of the cow herd.

Conclusion: When you are reading the markets, look at the three parts - finished market, feed grain market, feeder market. Monitor this all year long. I'll repeat my thumb rule - get rid of feeder cattle, no matter what the weight, in the second quarter. And again one, two, three: finished, feed grain, feeder markets, that's the process I use.

QUESTIONS AND ANSWERS

QUESTION: How is the Canadian dollar affecting the market now?

ANSWER: The devaluation of the Canadian dollar is reflected immediately in higher cattle prices. The packers in Toronto constantly monitor the situation and if they can see that the U.S. dollar is going to cost them more, they can afford to bid higher for domestic cattle. Here in Western Canada, if you can get $1.44 for a U.S. dollar instead of a $1.40 that you might have got last week, you'll be better off to go down into the U.S. market.

FIGURE 1

CANADIAN BEEF COW POPULATION

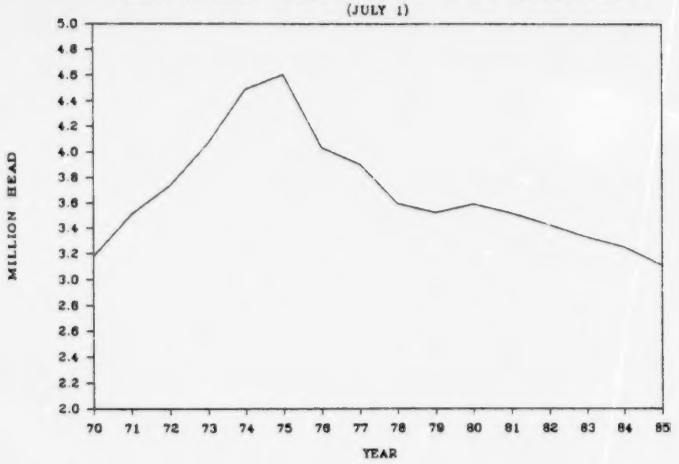


FIGURE 2

TOTAL F.I. CATTLE KILL

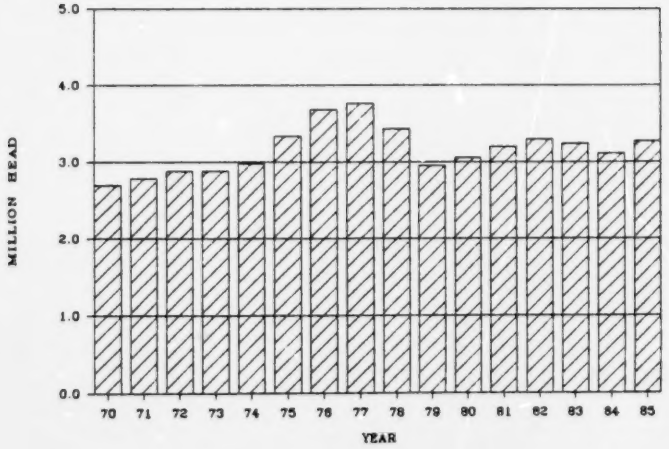


FIGURE 3

CANADIAN F.I. HEIFER SLAUGHTER

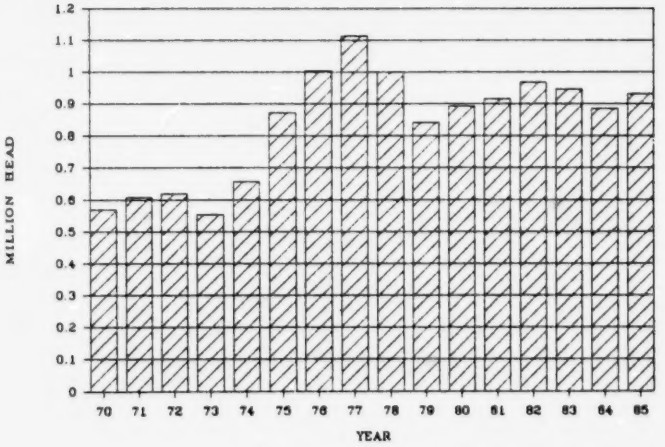


FIGURE 4

F.I. HEIFER KILL AS A % OF TOTAL KILL

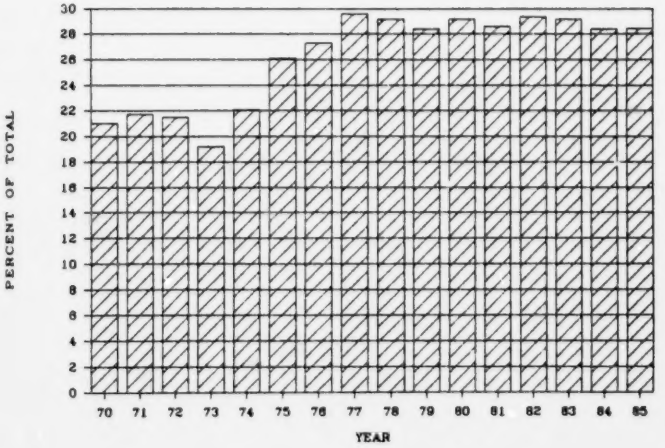


FIGURE 5

CANADIAN F.I. COW SLAUGHTER

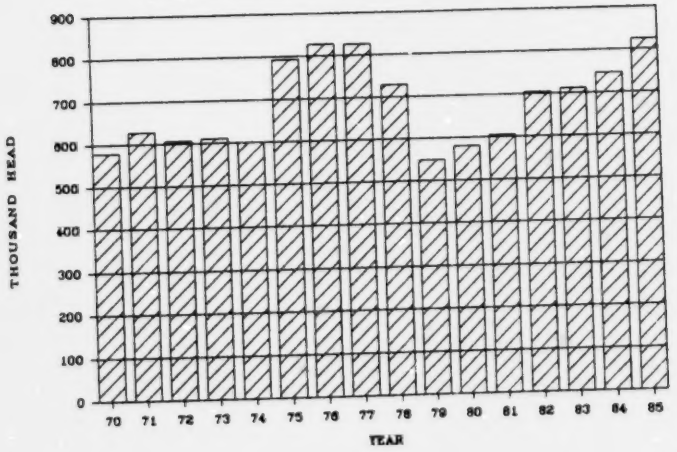


FIGURE 6

F.I. COW KILL AS A % OF TOTAL KILL

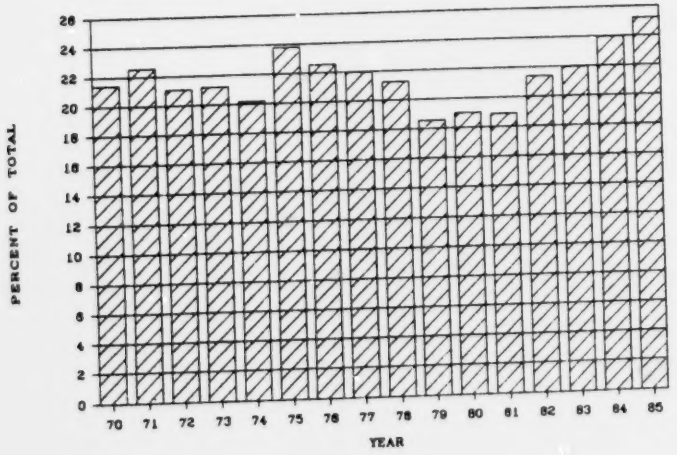


FIGURE 7

F.I. FEMALE KILL AS A % OF TOTAL KILL

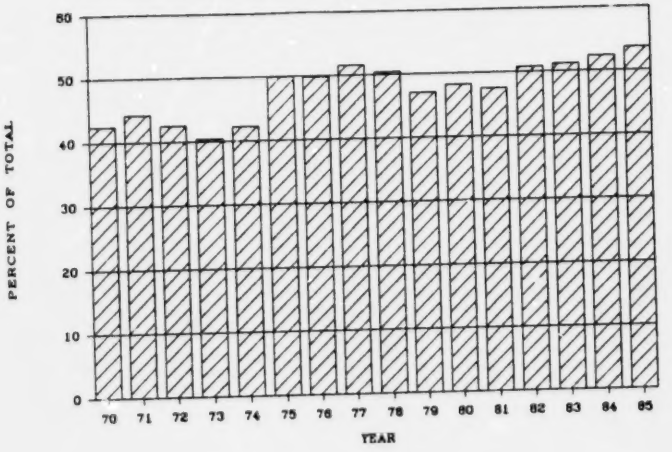
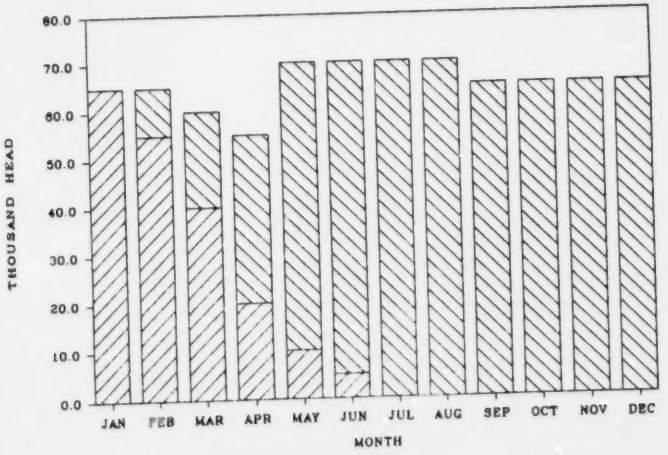


FIGURE 8

WEEKLY CANADIAN CATTLE SLAUGHTER



"U.S. FARM POLICY AND THE NORTH AMERICAN BEEF INDUSTRY"

William R. Farr
Farr Farms Co., Farr Feeders Inc.
Greeley, Colorado

Our family has our roots in Canada. My great-grandfather was born in Sparta, Ontario in 1860. He came down to Greeley in 1880 as a blacksmith. He went back and married my great-grandmother and brought her back to Greeley along with four brothers. I visited the home that my great-grandfather was born in and the blacksmith shop that he got his teaching and education in. There aren't many Farrs left in Ontario but there are a lot of my great-grandmother's relatives back there although they're kind of distant. I did discover that they were Quakers and we went and visited the Quaker Meeting House. Some of my relatives are still Quakers, but somewhere on that trip out west they seemed to have lost that identity.

We do have a lot in common with the Canadians. It's an honour to be included with such a distinguished group of speakers. It is good to be here.

The Farm Solution

The title of my talk is U.S. Farm Policy and the North American Beef Industry. This probably should be reversed because what happens in the industry, in the livestock and agriculture industry, very likely is what makes the farm policy. Our industry is in a shambles, very similar to yours in Canada. Farm policy is always a result of enough pressure from the political system that is a result of economic conditions.

Our average break even of producing a calf is considered to be 82 cents a pound. The average selling price, this last year, was about $20. a hundred less than that. On a five hundred pound animal, the producer's losing about $100. a head. The average break even of the feedlot steers is figured to be about $70. a hundred. The average selling price last year was about $60. a hundred - another $100. a head loss. So, it doesn't make any difference right now what segment you're in, the losses have been substantial.

Last summer, it was in the paper that the cattle feeders were losing over $1 million a day in the United States. Our current farm debt is over $220 billion. That's bigger than the foreign debts of Mexico and Brazil combined.

The cattle inventory this year is going to be right at 105 million head. That's down from 132 million head in 1975. It may dip below 100 million head before it stabilizes. Beef cow numbers are at about 47 million, the lowest it's been since 1961. The calf numbers this year will be the lowest in 30 years. The January 1st cattle and feed report showed that cattle on feed in the seven major states to be 91 percent of a year ago. The placements for the last three months were only 89 percent. Marketings were holding in at about 98 percent. There's liquidation in all phases of the cattle business.

We think that we've seen the bottom of the slide in beef demand, it's stabilized. Although in 1985 cattle slaughter was three percent less in numbers, beef production actually increased one percent because of an increase in the average carcass weight. People kept feeding the cattle to wait for the better market which never came. Average carcass increase for the year was 26 lbs. heavier than a year previous.

Dollars spent on beef in 1985 in the United States were twice as many as those spent on pork, four times as many dollars as spent on poultry. From 1960 to 1985, the percentage of dollars that

were spent on food in the United States decreased 25 percent. During that same period of time, the amount of dollars spent on beef decreased 32 percent. We've not kept our share of the food dollar. Per capita beef expenditures from 1978 to 1985 increased 14 percent which sounds good except the consumer price index increased 78 percent. If retail demand for beef had been as strong in 1985 as it had been in 1978, choice steer prices would have averaged $100. per hundred weight instead of $60.

During this same period, 1978-1985, retail beef prices at the stores increased 28 percent, but fed cattle only increased 14 percent. The increase in cost to the consumers is not being shared back and the producer's on the short end. Feeder calf prices decreased one percent during that period of time. From 1960-1980, **total meat supplies,** (retail cuts), increased per capita 155 to 195 lbs. That's an increase of over 25 percent. In order to achieve that increase, in that 20 year period, meat prices dropped 50 percent on a deflated basis.

We can show a 25 percent increase in pounds but as a result of a 50 percent drop in prices. The losses have resulted in tremendous change in our U.S. industry. The U.S. has gone from six and a half million farms to 2.3 million farms in 50 years. During that time, the farm acreage has not changed. The farm size has increased from 155 to 440 acres. Today, 75 percent of the cash receipts from farming come from only 300,000 farms. It is estimated that in only 10 more years, there will only be 100,000 farms in the United States producing 75 percent. This is a result of modern technology and capital.

The government is basically wrong in worrying about small family farmers. The ones that are in trouble are the big commercial operations regardless of size. They are considered in trouble if they have a 70 percent debt to net worth ratio; most of them are quite a bit closer than that. Five to 10 percent a year are going out of business.

Our biggest indirect problem is federal deficits. This causes high interest. In the 1970's, 30 percent of the cash farm income in the U.S. went to pay interest. In 1985, 50 percent of the cash farm income went to pay interest. U.S.D.A.'s farm debt to asset ration hit 20 percent in 1983, the first time since the depression and double that of 20 years ago. Obviously we must reduce the deficits.

The Gramm-Rudmann Act is putting the fear into a lot of people because it looks as though that might balance the budget by slashing all kinds of programs. Lots of people are concerned because they're the ones that might be losing out. The Gramm-Rudmann Act is so strong that everybody is going to lose out as far as taking cuts. The end result will be beneficial if we can last through that period of time however long that takes, two, three, four years, to get the deficit down. We would rather be hurt now and lose some of the benefits of federal programs rather than pay these interest bills. This is a positive step in the right direction. It's far from perfect, but it is the first time the U.S. has taken a major step to keep the budget under control.

Our biggest direct problem is declining land values. Real estate values have dropped 35 to 50 percent in most farm areas of the United States. We've lost from $150 to $175 billion in land value in the last five years. That creates a lower equity, causes some foreclosures. A lot of those properties are turned over without going through the foreclosure process. As the banks liquidate properties, land values are forced down even further because there's not many buyers. Fire sale prices diminish all of the surrounding values, forcing others out of business; more foreclosures. It's a domino theory. Anybody that has the cash isn't putting it into agriculture because the returns

still aren't there. It just won't cash flow. That's the biggest lesson that we've learned in the cattle business in the last few years. Its got to cash flow.

Ranch operations in our area, in the U.S. need 250 head of cows minimum if that operator is dependent upon the cow herd for livelihood. The average cow herd in the United States is 50 head. Seventy-five percent of U.S. cattle producers have less than 200 head. Therefore, three-quarters of our cattle producers must be part-time. Some of the wheat operations have to have cattle almost as a secondary item, to really exist.

Cattle feeding is also changing. In 1960, 60 percent of the cattle fed in the U.S. were fed in feedlots of less than 1,000 head. In 1985, 60 percent of the cattle were fed in lots over 16,000 head. There are 200 feedlots in the United States that have a capacity of 32,000 head or larger. The shift in cattle feeding is the same as ranching. It's changing dramatically away from the corn belt. Iowa has the smallest number of cattle on feed since 1960. The cattle are moving out of Arizona and California and they're going into a loop in Nebraska, Kansas, northern Texas and the eastern part of Colorado, just a little oblong circle.

The reasons for centering the cattle feeding in that area are many - available financing, investment feeding, technology, environmental concerns and packing plants. There hasn't been a packing plant built in the eastern U.S. and the corn belt in the past 20 years. All of the cattle plants have been built from Amarillo north.

What's the outlook for 1986 and beyond? When you forecast, you have to learn to forecast often. Forecasting is also very difficult, especially when it concerns the future. But, the famous last words I have is that the market can't go down forever. We are right in the middle of our peak supplies, with almost record slaughters in the last two or three weeks. We think the market will rebound pretty quickly $5. or $6. in a couple of months. By a year from now, though, it will be back down in the low 60's.

The tax reform bill, if passed, would have eliminated some of the tax feeding of cattle. The House passed it; the Senate this summer will pass the bill so, consequently, there will be a lot of tax feeding this fall to get in under the wire before the new tax law goes into effect. We'll have lots of cattle placed this coming fall and coming out the same time a year from now. But, I think that's probably the last time. From then on we're going to have increasing prices. Profits should come with that. We'll probably get some growth back into the industry. There will be smaller beef supplies and modest growth in demand.

The Beef Promotion and Research Act was passed this year as part of the farm bill, helped through by Joanne Smith, the President of our National Cattlemen's Association. It goes for about 22 months and then we vote on it. So, we'll have roughly two years to raise a lot of money to convince the beef producers in the United States that it has some value and we can get some demand back. This will raise somewhere around $50 to 60 million a year. We're currently spending $10 million. Ten million in the U.S. doesn't do much. We think that with $50 or $60 million on research and promotion that we can get a lot done. That's why we think that we might have bottomed out the drop in the demand for beef.

Every time an animal is sold, it's checked-off a dollar a head. If its sold four different times, it will have four different dollars charged against it. We're going to tax all the imported meat coming in, too, at the same equivalent of a one dollar a head. As imported meat comes into the United States the carcass equivalent is calculated, and the importer pays a dollar a head. So, we're getting some of your Canadian money down there to

help us promote beef in the U.S. and if our market in the U.S. and our prices go up, your prices probably ought to improve, too.

We will have relatively stable costs in the cattle business. Lower interest rates, lower energy costs, lower land, some new investment incentive and those operations will cash flow.

U.S. and World Trade

In 1985, the trade deficits in the United States were a new record - $148 billion. In December alone, imports outpaced exports by $17 billion - an all-time high monthly figure. For the year, imports into the United States were up six percent, $362 billion. We exported $213 billion, down two percent. Japan accounts for one-third of the U.S. trade deficit - almost $50 billion. Western Europe is next - $27 billion. Canada is third - $22 billion. Canada's deficit with the United States is double that of OPEC's $11 billion.

The reasons for the deficit are always complex and varied. The biggest problem is the strength of the U.S. dollar. The dollar needs to decline in value to relieve competitive pressures on manufacturers from foreign markets. It has declined 24 percent in value since its peak in March 1985 against most of the currencies in the world, except Canada.

Our next problem is the price supports for grains have increased the world production. We set a price floor that was so high the rest of the world could get in and make profits because their costs were less. From 1975 to 1983, our wheat loan went from $1.37 bushel to $3.65 a bushel. We caused thousands of acres to go under cultivation in foreign countries. China's almost sufficient in wheat now. Australia can't sell it either, but they can produce it. The U.S. owns and stores 60 percent of the world's food reserves. But we can't sell it and we can't afford to give it away. The Farm Bill significantly lowers those supports. The Gramm-Rudmann Bill is going to lower them even further. We're going to get back in line. But, there's only so much demand in the world and that means we're going to take it away from somebody else.

The embargoes that our Presidents put on in 1973 and 1980 were disastrous. They gave the U.S. a reputation as an uncertain supplier and stimulated foreign market development. Back in 1973, Brazil produced hardly any soybeans. As of last year, they're the second largest soybean exporter in the world. Primarily developed with Japanese money so they wouldn't have to rely on the U.S. for soybeans if we had another embargo. The world competition has slashed prices for most of our U.S. farm commodities and that's been the reason for our farm land values falling. The current prices that are needed for world trade cannot support our land prices in the U.S. where they are.

We consider the EEC to be one of our biggest problems in foreign trade. Their Common Agricultural Policy has subsidized their agricultural production to the extent they no longer import very much agricultural products and they subsidize exports to countries that we'd be selling to. As of last year, they'd become the largest beef exporter in the world. They have about a million metric tonnes in storage. They will not cut their prices in their member countries. Their own people don't have the incomes to buy it. Common Agriculture Policy subsidizes those sales just to get rid of it.

In 1980, we made a deal with Ireland through GATT. Europe would take 10,000 tonnes of U.S. high quality beef and we would take 5,000 tonnes of Irish beef. That's a 2:1 margin. In 1984, Ireland fulfilled their commitment sending us 4,834 tonnes. We managed to send to Europe 590 tonnes, a 1:8 ratio in their favour done with non-tariff trade barriers. The third country directives say our inspection and processing doesn't meet their standards. If we did, they'd change

their standards. We're about to get that resolved and now they're going to ban antibiotics and growth hormones.

We rapidly are developing a trade war. On December 30, 1985, the U.S. put restrictions on steel from EEC. Less than a month later, January 28, 1985, the EEC put restrictions on fertilizer, paper and animal fat from the U.S. Trade losses, that add to $50 million for each side. I think we're going to do something like that every month. It's a no win situation.

We did negotiate a new agreement with Japan's LIPC - Livestock Industry Promotion Corporation, a semi government agency expiring in April, 1988. They had been taking 30,800 tonnes and they will increase 6,900 tonnes each year for four years. From 1978 to 1988, they will have a 400 percent increase from the United States. It's very difficult to deal with Japan, but, once you do, their word is good. Six thousand and nine hundred tonnes isn't very big, but it was significant to the agriculture community. Although they have our largest deficit, we have to be careful in agriculture because Japan is the largest importer in the world of United States agricultural products. How much of a war do you want to get into with your biggest buyer? Their farmers are extremely organized and unified and powerful. We had one economist that looked into his crystal ball for what the future might hold. The first think he noticed was that the crystal ball was made in Japan. A bumper sticker in the United States said LOVE AMERICA, THINK AMERICA, KEEP AMERICAN STRONG. It was on the bumper of a Toyota.

What is the United States doing about the trade problems? In 1985, our United States Department of Agriculture had an Export Enhancement Program. We subsidized the sale of wheat and wheat flour to Algeria, Egypt and Turkey. These countries were specifically picked out as ones that U.S.D.A. thought would hurt our friends less than we would hurt the EEC and some of the other suppliers of wheat. This is just the beginning.

President Reagan appointed a national commission on agricultural trade and export policy. They have a program titled "20 Ways to Improve Agricultural Exports". Congress, in December, passed a bill limiting textile and shoe imports. Our Congress is becoming very protectionistic. Reagan is more inclined to want freer trade so it was vetoed, but it went through both houses of Congress.

Preparations have begun for a new round of GATT. Europe and everyone else has for years out-traded the United States. We're trying to get that changed. Clayton Yider is the new special trade representative, a Cabinet position. He's a Nebraska farm guy, very bright, had a lot of good jobs. We're looking forward to the next round because we're putting the gloves on. We're not going to sit back and take it. The purpose of those negotiations, between 90 member countries, is to fight protectionism, strengthen the world trading system, and to liberalize and expand trade. We'll be prepared; we will not get what we want. You never do; we're going to get more than we've every gotten.

The new Farm Bill contains a number of provisions that affect trade. One provision calls for a study to label all imported meat and meat products, identify those pounds of meat, label them with something so it's not patriotic to eat it. All they did was approve the study. I honestly don't think anything will come from that, but it shows how concerned they are on imports. Another calls for the purchase of 200 million pounds of beef a year, to be distributed to U.S. military operations around the world. They're going to spend $200 million to subsidize U.S. beef for the overseas servicemen to eat. Another provision calls for $325 million a year to assist the commodities affected by unfair trading practices.

They budgeted two billion to expand the Export Enhancement Program. We're

going to subsidize, like Europe, to move our products, to get rid of our surplus. Somebody else is going to have surplus, so somebody else is going to subsidize a sale. I don't know where that goes. You could take it to eternity and it's all subsidized. The United States doesn't have much choice but to try and get out from under our kind of government programs, get rid of the surpluses and then get on a world open market basis.

NC and Trade

The National Cattlemen's Association is responsible for and continues to monitor our meat import law, passed in 1964. Last year the U.S. imported a billion two hundred and ten million pounds of meat, the largest importer in the world. The meat import law guarantees access to countries that are shipping their meat to us. The meat import law makes trade predictable because we know for this coming year how much imported meat we'll have within a hundred million pounds. So, we live with this law.

Australia brings in 50 percent of the meat that we import in the United States. New Zealand - 28 percent. Canada - 11 percent. Those three countries are right at 90 percent of all of our imports. They're also our three closest allies. That's another reason why we would be taking that product. The amount of meat that we import would be equal to 7.7 percent of U.S. beef production. That's a reasonable figure that we can live with. In 1985, the imports were up, over 1984, 10 percent, but still within the guidelines. The National Cattlemen were responsible for getting the Beef Promotion Act in the Farm Bill. Our former NCA President, Joanne Smith, very likely is going to become the head of that body when its approved. We'll be in the middle of that Beef Promotion.

The National Cattlemen have formed a Meat Industry Trade Policy Council with five national groups in Washington. The purpose is to foster, develop, and implement a united effort in pursuing trade policy for the red meat industry. Our National Cattlemen's continues to support our meat export. We have two Directors, and both of those Directors sit on the Executive Committee of the U.S. Meat Export Federation. Our current president of our National Cattlemen's is a past-president of the Meat Export Federation. Our cattle group is very involved in foreign trade.

The relationship between the U.S. and Canadian Cattlemen. At the top level, between the NCA and the Canadian Cattlemen's Association is extremely good. We communicate well, directly and frequently. We're in touch with people like Charlie Gracey, Chris Mills, Gary Jones, who's been on foreign trade for a long time, Stan Wilson, and Ron Oswald almost on a monthly basis. Most of them attended our national convention in San Antonio. We're aware of each others political problems and internal problems.

Along with the New Zealanders and the Australians, the Canadians and the U.S. have formed a four nations beef conference. Every 18 months the leaders of these four bodies meet. Just this past summer in Calgary our four groups got together. Some of you were there. That's been very constructive. If we just understand each other, we can keep working together. This year, for the first time in the 10 year history, the United States Meat Export Federation had its annual meeting outside the boundaries of the United States - Toronto, Canada. Had a lot of the Canadian people there, including Charlie Gracey again, and had a one day seminar just talking back and forth on the problems between the two countries.

We have a very basic item in common with Canada that a lot of our U.S. producers don't realize. There are only three countries in the world that eat fed beef - Canada, U.S. and Japan. The rest of the world eats veal and grass fed beef.

The NCA recognizes Canada as the largest trading partner of the United States. The two-way trade between our countries is roughly $110 billion. Exports to Canada were approximately $45 billion, one-fifth of the total exports from the United States. But, Canada did have an $11 billion deficit. They exported more to us than we did to Canada.

Unfortunately, cattle and beef trade is out of balance. The U.S. cattlemen believe that non-tariff trade barriers, such as blue tongue testing, is unfair. The NCA has even a special committee called the Canadian Border Relocations Committee to monitor the problems that our northern states have. We met this last May 1985, in Billings at the Montana Stock Growers' Convention. Some of your people were down there and we had a good discussion.

But, to let you know how well we have done, I'm going to read to you a letter to the Editor that was in the January 23, 1986 Western Livestock Reporter in Billings, Montana. That's one of the more widely read, primarily cow-calf, magazines in the northern United States. I've taken excerpts out of it, so it's going to sound worse. But the sentence is a quote.

"This last year, 1985, has set a record in the destruction of the cattle producer. The whole industry is reeling and on the ropes due to the low prices we have received the last three years. We can't think kindly of our government and Congress who let us get stabbed in the back by other countries with this import situation. Canada, with the wide open border coming this way, not the other, brings in about 450,000 live cattle. I am not writing this just to be writing. I am writing this because I am damn mad at this whole import situation. I was also damn mad last spring when our people flocked to Canada and brought all those feeder cattle down here because the border is wide open to all Canadian cattle. I am sure this deal has affected and contributed to our sour cattle market. Other times Canada has moved their cows down here and killed our cow market. Our west coast markets are at times under extreme pressure from Canadian fat cattle. This wouldn't happen if the border wasn't wide open. Free trade is going to kill the cattle industry. We don't need one pound of foreign beef. We are the largest producer of beef in the world and the largest importer of beef in the world. The only thing that is going to go away is the beef producer and he is going to go away broke."

That's signed by Walt Johnson, Montana. Walt Johnson is past-president of the Montana Stock Growers', past regional vice-president of the National Cattlemen's Association, and current director of the U.S. Meat Export Federation. Two years ago he was a candidate for Lt.-Governor in the state of Montana. This letter will give you a feeling of what some of our cattle producers are thinking.

From the NCA standpoint, the national level, that is not our attitude or policy. My problem is going to try and figure out how I might be able to respond to Walt. He's inaccurate in a number of instances with his facts. He's a little out of date and we consider him somewhat short-sighted. However, it is a belief by many that he shares. So, I would caution Canadian Cattlemen to not abuse that current situation. I am not familiar with your provincial or national politics. But, I thought I might just throw out a few fundamental ideas or opinions.

1. Because of the value difference in our currencies, cattle will quite naturally literally flow to the United States at the present time.

2. Because of the collapse of the cattle industry in the United States, large numbers of imports will generate much distress and prompt political remedies. So, the more that's shoved, the more animosity, the more reaction. The knee jerk situation.

3. It would be beneficial to use some discipline and common sense to orderly market reasonable numbers of cattle to the United States.

4. Any short-term gain received may result in longer term losses in the future. The National Cattlemen's welcomes Prime Minister Mulroney's invitation to begin negotiations with the U.S. on a comprehensive free trade agreement. We think that would help alleviate some of these problems that are surely building up now. Our immediate past president, Joanne Smith, has been appointed to a task force to study the feasibility of reducing the barriers to trade from the United States and Canada. If a bilateral agreement between our countries would ever come to pass we, the National Cattlemen, would eagerly look forward to developing a deep, long lasting and profitable trading relationship with you.

QUESTION AND ANSWER SESSION

QUESTION: It was suggested that the Gramm-Rudmann Amendment might lower loan rates. Why wouldn't it have more effect on target prices in order to reduce the deficit by reducing deficiency payments?

ANSWER: The Farm Bill lowered the loan rate on corn from $2.40 to $1.92 and Gramm-Rudmann lowered it further to about $1.85. The deficiency payment will still be based on the target price, and this year could be pretty big. Part of the deficiency payment will be "in kind" to help get rid of the surplus. In two or three years we'll have it down to a pretty good balance. I'm at a disadvantage when I get out of cattle into grain, so the answer may not be as specific as you'd like.

QUESTION: Would we be better to skip the sales rings along the border, thinking of Walt Johnson's letter, and move our cattle deeper into the U.S. say Nebraska, so they are not "Canadian" cattle but just cattle.?

ANSWER: I agree, and I'd truck them from midnight to 5:00 a.m.

QUESTION: What about moving more processed meat rather than live animals into the U.S. market?

ANSWER: It's now covered under the Meat Import Act so you wouldn't move additional pounds into the U.S.

ELECTRONIC FENCES - CHEAPER BY A COUNTRY MILE

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Introduction

During the past several years there has been increased interest in, and use of, electric fences for livestock and predator control. This has been due, in part, to the high costs (materials and labour) of conventional fencing; to sub-division of pastures for rotational grazing; and to the introduction of high-power New Zealand electric fence systems.

An electric fence is a psychological rather than a physical barrier. The electric fence is effective because the animal is afraid to touch it. This fear arises from the animal receiving a shock from touching the wire, or by observing the effect on another animal. Since animals don't normally touch an electric fence, there is little or no pressure on the fence. Consequently post and dropper spacings can be increased, and the number of wires used, wire tension and post size can be reduced compared with conventional fences. The overall result is a low cost, effective fence. Electric fences are relatively easy and quick to erect, and if done properly, have a low annual maintenance.

Electric fences generally do require more frequent checks than do conventional fences to ensure their effectiveness. Fencers should be checked several times a week, especially those operated by a battery. Shorting out of the fence can also occur, especially if the fence has both live and grounded wires.

Training Animals to an Electric Fence

Animals which have never before been exposed to an electric fence should be trained to it. Training can be done in the yard or corral or in smaller parts of the fenced area. Attract animals to the electric fence by hanging shiny metal objects on the electrified wire, or by placing grain or hay under the fence such that the electrified wire must be touched to reach the feed. For fencer models with two or more pulse speeds, use the fastest one for training.

Training will be more effective, and longer lasting, when the ground is wet. Under very dry conditions, animals can be encouraged to touch a live and grounded wire at the same time. The intensity of the electric shock, or current delivered to an animal, is much greater when the animal is well grounded.

The voltage on the fence should also be increased for training animals. The higher voltage can be obtained by electrifying only that portion of the fence where animals are being trained and/or by using a stronger fencer, if available. The minimum effective voltage (guard voltage) for short haired animals is about 1000 volts, and for long haired animals about 2000 volts. This should be increased to 4000 volts or more for training.

Avoid situations where animals crowd and some are pushed through the electric fence. For large numbers of animals, several smaller groups could be trained at one time.

Fence Energizers (fencers)

1. Power output - Many electric fencers available today produce high power output, with low impedance. Consequently, long distances of fence can be electrified, even with current leakage from vegetation touching the fence. Most older fencers, and even some new ones, have a low energy pulse with high impedance.

These fencers will short out due to energy leakage from uninsulated, wet posts or from vegetation touching the fence.

The Joule is the standard International metric measure of energy output by electric fencers. One New Zealand company manufactures different fencer models with energy outputs from a low of 0.08 Joules to a high of 8.2 Joules. This would be about the same as comparing the work you could do with One and a 102 horsepower tractor.

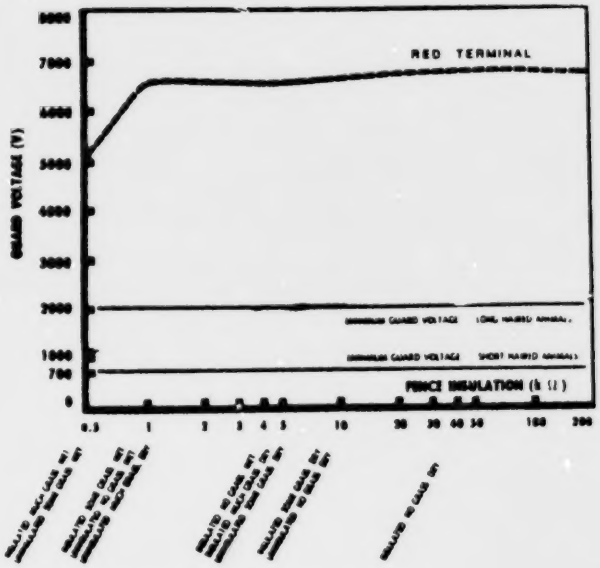
A comparison of power output of all makes and models of fencers is very difficult since the Joule is not used by most North American fencer manufacturers. For example, Baker Engineering, Edmonton, makes fencers with 40,000 watt output. This would appear to be equivalent to about 1.5 Joules.

Fencers operated from 110 V power must be CSA approved for use in Canada. The maximum fencer power output that the CSA appears to be willing to approve at this time are those of about five Joules. In many cases, individual provinces authorize the sale of certain models of 110 V fencers prior to CSA approval.

2. Fencer evaluations - The Prairie Agricultural Machinery Institute (PAMI) have carried out tests on many makes and models of fencers. Unfortunately, no reports of tests have been published since 1981. A few of the PAMI tests will be briefly mentioned to illustrate results with high and low energy output fencers.

Evaluation of the Gallagher (NZ) Bev II fencer is shown in Figures 1 and 2. The Bev II has a maximum energy output of 4.9 Joules on the High-power (Red) terminal. There were about 7000 volts on a 16 km (10 miles) simulated, well insulated fence, free of vegetation

Figure 1

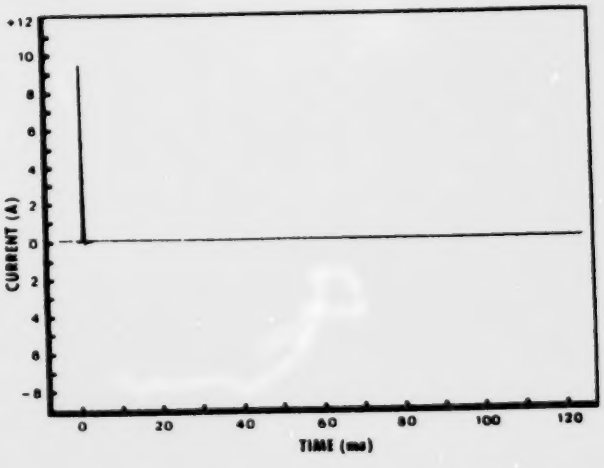


Guard Voltage Produced on a 16 km Single Wire Fence

(Figure 1). There were about 5000 volts on the same length of fence touching wet grass, and/or uninsulated.

The current delivered by the Bev II, or shock received by a well-grounded cow (standing in water and licking the charged wire) touching a 10 mile well-insulated fence is shown in Figure 2. The intensity of shock received is directly related to the height of the peak current; in this case, a rapid,

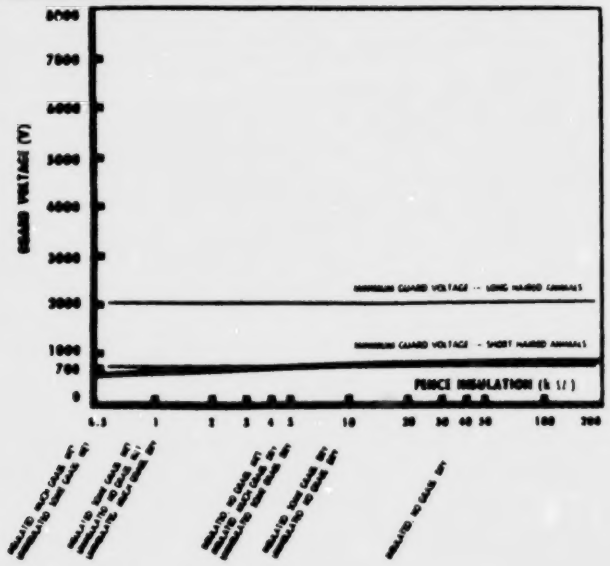
Figure 2



urrent Delivered to a Well-Grounded Cow Touching a 16 km Well-Insulated

very intense shock. The shock received by a normally grounded cow on the same fence was about one-fifty as great. This illustrates the advantage of training animals under good grounding conditions and inducing them to touch the charged wire with their tongues or noses. Conversely, under poor grounding (drought, a fencer with a high power output is required to be effective. Results of the PAMI tests on the Gallagher (NZ) KM 2 fencer are shown in Figures 3 and 4.

Figure 3



Guard Voltage Produced on a 18 km Single Wire Fence.

Figure 4

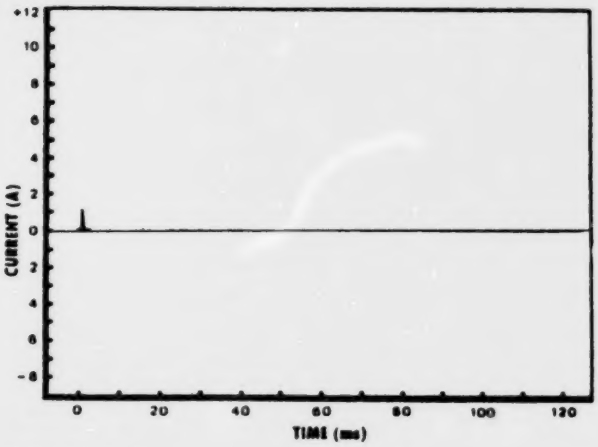


FIGURE 4 Current Delivered to a Well-Grounded Cow Touching a 18 km Well-Insulated Fence

The maximum energy output of the KM 2 fencer is 0.1 Joule, or about 50 times less than for the Bev II. With the KM 2, voltage on a simulated 10 mile single wire fence was about 800 volts under the best conditions (insulated, dry) and 600 volts under poor fence conditions (uninsulated, wet). The current peak delivered to a well-grounded cow was fairly sharp, but quite low. PAMI results for a Parmak (USA) 6 volt fencer are shown in Figures 5 and 6. The voltage dropped to nearly zero under poor fence conditions (uninsulated, wet). A very slow, low peak current was delivered to the cow. The energy output of the Parmak 6 V fencer was not provided by the manufacturer.

A simple measure of the power output of fencers is obtained by measuring the voltage before and after placing a 500 ohm resistor between the live (power) and ground terminals of the fencer. For example, the Gallagher (NZ) E 12, 12V fencer produces about 6500 volts without the resistor, and about 4200 volts with the 500 ohm resistor. Many 6 and 12 volt fencers drop from several thousand volts to a few hundred volts when the resistor is placed on the fencer.

3. Powerline versus Battery-operated fencers - Where 110 volt power is available, it is generally advisable to use a power line fencer. This will eliminate the need for batteries to operate the fencer. A 110 V to 12 V transformer can be used to operate some 12 V fencers. The power output of battery-operated fencers can vary from many times weaker, up to equal, or higher than

high-power 110 V fencers. The size, type and number of batteries required depends on the efficiency and power output of the fencer. One New Zealand 12V fencer was 0.08 Joule energy output draws only about 10 milliamps of power. Six good alkaline flashlight batteries will operate this fencer for two to three months.

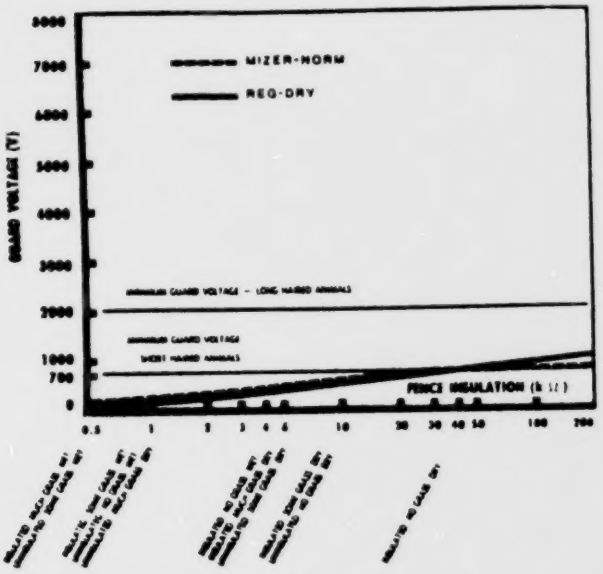


FIGURE 5 Guard Voltage Produced on a 16 km Single Wire Fence

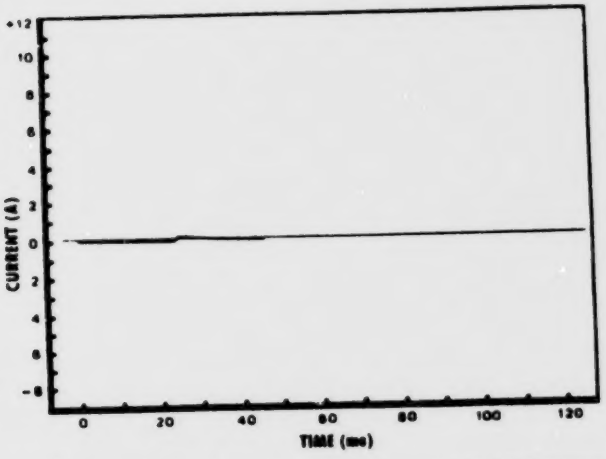


FIGURE 6 Current Delivered to a Well-Grounded Cow Touching a 16 km Well-Insulated Fence

4. Solar Power - The photo voltaic cells in solar panels convert the sun's rays to electric energy. The solar panel acts as a trickle charger to maintain a battery in a charged state to operate an electric fencer. The battery must have enough reserve capacity to operate the fencer at night, and during prolonged rainy periods.

A solar-powered 12 volt fencer (Striker) is being manufactured in Saskatchewan, using New Zealand fencer electronics. The power output of this fencer is only 0.08 Joule. It produces about 4300 volts with no fence load and about 1200 volts with the 500 ohm test described earlier. Another model with twice the output should be available from the same manufacturer later this year.

There are several U.S. made solar fencers. Three which I have tested with the 500 ohm resistor are less powerful than the Striker described above.
All of the above mentioned fencers have a solar panel mounted on the outside of the fencer case, and a rechargeable dry-cell battery inside. High-powered solar fencers are available simply by using one or more solar panels to recharge a wet-cell battery (or batteries), which provides power for the fencer. The size and number of solar panels required depends on the power requirement of the fencer. Two three watt 12 volt solar panels, which each generate about 200 milliamps of current under full sunlight, are recommended for use with 12 volt fencers of about 1 Joule energy output. These fencers draw about 100 milliamps current from the battery. The present cost of the two three watt panels including mounting brackets, is about $150.00.

Grounding and Lightning Protection

High-powered electric fencers must be

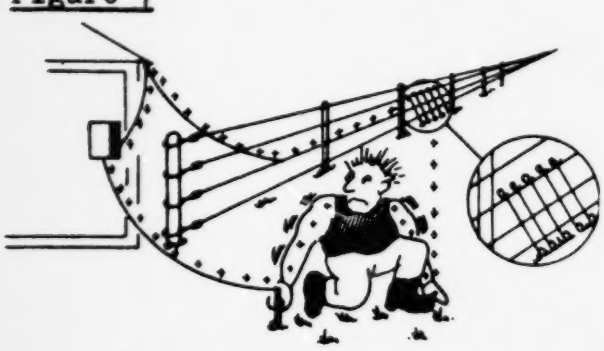
adequately grounded to work properly. If possible, place galvanized ground rod(s) in a damp location. One nine foot rod is better than three six foot rods. However, under some conditions two or more ground rods may be required, each spaced at least nine feet apart. Use one length of galvanized wire from the fencer ground terminal to all ground rods, and fasten the wire tightly to the ground rods with galvanized clamps or solder.

If one or more grounded wires are used on the fence, these wires should be grounded at least every half mile along the fence.

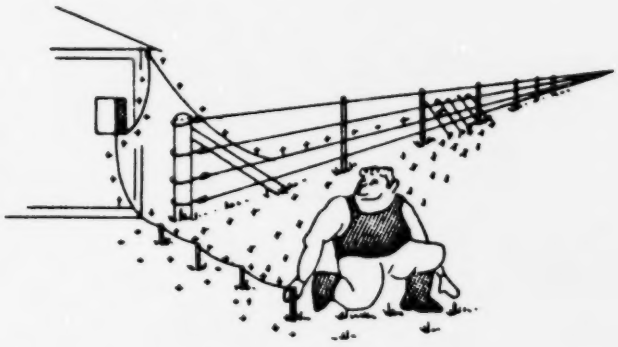
Testing for proper grounding

Figure 7 - The electric fence is shorted out at least 100 M (330 ft) from the fencer, by laying one end of several steel bars on the electric wire and the other end in damp soil. Wet your hands and place one on or into damp soil and the other on the last ground rod. If the rods are making good electrical contact with the soil, no shock should be felt. If a shock is felt, use more ground rods, and/or use a grounded wire on the fence. If a voltmeter is available, drive a metal rod into the soil at least 10 feet from the last fencer ground rod. A reading of more than 300 volts (0.3 Kv on a digital voltmeter) between these two rods shows inadequate grounding.

Figure 7



POOR GROUNDING



GOOD GROUNDING

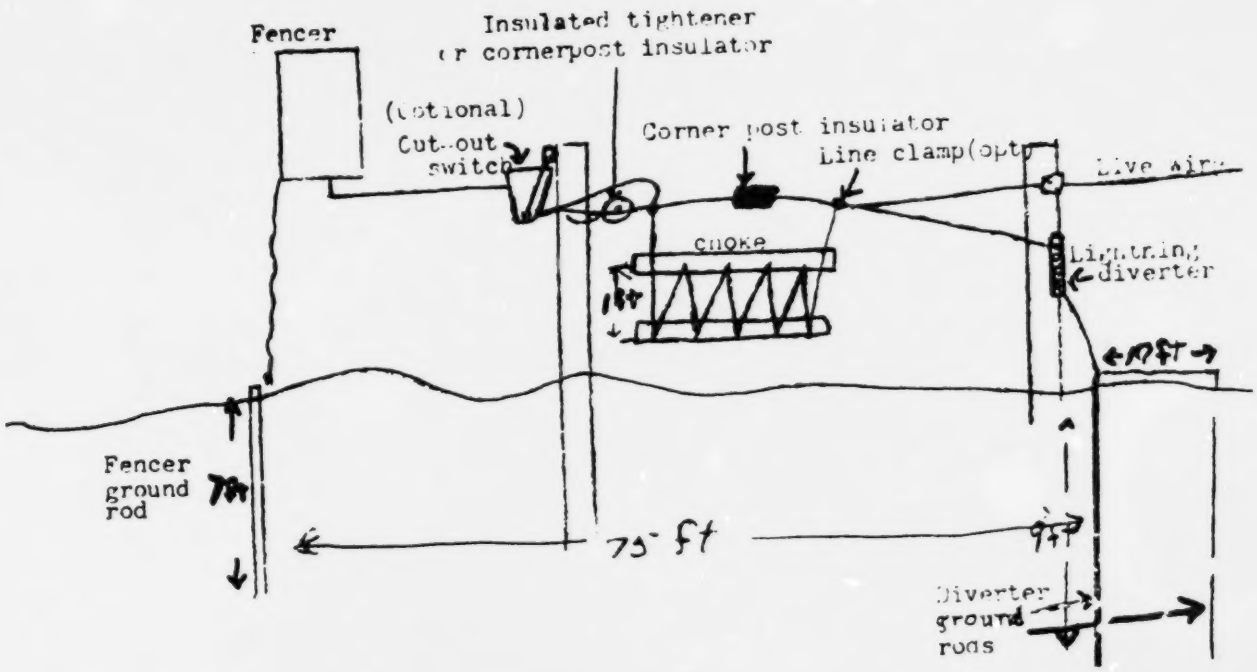
A lightning diverter and choke (Figure 8) greatly reduces the likelihood of lightning damage to the fencer. The diverter should be grounded better than the fencer (at least 75 feet from the fencer ground rod(s)). This, combined with the choke, which acts as a small resistance to current flow, directs the lightning current to ground through the diverter. A very severe lightning strike may damage the diverter, but it is much cheaper to replace it than to repair the fencer. For total protection of the fencer during lightning storms, the fencer should be completely disconnected from the fence and from the 110 V power source.

In very bad lightning areas the top fence wire can be grounded about every 1000 yards in damp areas. Don't connect this grounded wire to the fencer ground rod.

Fence Wire

A variety of types and sizes of wire and electric string can be used, depending on whether the fence is permanent or temporary. Barbed wire is not recommended, especially if it is old and rusty. Also, with high-power fencers, any small animal getting caught on electrified barbed wire could be killed.

Figure 8



A. **Permanent Fence Wire**

1. High tensile 12 1/2 gauge galvanized wire is a very strong, stiff wire, designed to last many years. It is recommended for perimeter fences where there is a possibility of stray animals or wild life hitting the fence at night.

   Since high tensile wire is so stiff, splicing of the wire is often done with special sleeves, rather than typing a figure eight or slip knot. Permanent wire tighteners, which will tighten up to one-half mile of wire, should be used on each strand of wire. The wire can be easily and quickly tightened or loosened as required. The wire should be loosened during the winter to prevent damage to the corner posts and insulators.

2. Used telephone wire is by far the cheapest, if available. However, much time may be required to unroll the wire. A spinning jenny (wire reel) is recommended for handling permanent fencing wire.

3. A softer and somewhat smaller diameter wire (13 gauge) than high tensile wire can be used for permanent dividing fences, or for temporary fences. The 13 gauge wire is also easier to handle and somewhat cheaper.

B. **Temporary Fence Wire**

1. Small galvanized wire of 16 gauge or more, is low in cost (about 1¢/ft.) and easy to handle. Any problems with poor visibility of the wire by animals can be overcome by hanging shiny objects on the wire.

2. Baygard VI and IX contains six and nine strand each, respectively, of aluminum-magnesium alloy wire and fiberglass. Baygard VI breaks fairly easily and therefore should only be used on fences of about one-quarter mile or less. The manufacturer claims that Baygard IX can be used for many miles of fence. However, the cost is relatively high and it breaks much easier than 16 gauge wire. Baygard should not be left outdoors over winter, unless the electric fence is being used.

3. Polywire is a combination of plastic and fine stainless steel wires. Since stainless steel is a poor conductor of electricity, the length of fence is limited to one mile or less with polywire containing six strands of stainless steel, and less than half a mile for polywire with three strands of stainless steel. Polywire is somewhat stronger than Baygard, but polywire stretches if pulled too lightly. Problems arise if the stainless steel breaks but not the plastic strands; electricity will not flow past that point. Polywire should be stored inside when not being used.

Fence Insulators

The question most often asked is whether or not insulators are required with a particular fencer model. About 10 years ago Baker Engineering, Edmonton, advertised widely that insulators were not required with their BEE electric fencers. Other North American fencer manufacturers now also state that insulators are not required.

Under certain conditions, with old, dry wood posts, insulators may not be required. However, if the posts are wet, and if live grounded wires are used, excessive leakage of current will occur and the electric fence will not be effective. An analogy of this situation is when a plumber installs a water system and forgets to solder the joints in the pipes.

New Zealand fencer manufacturers strongly recommend the use of insulators, even with fencer models much stronger than those made in North America.

Good quality, long lasting plastic nail-on insulators are now available for wood posts. The cost per mile of fence for insulators is quite small, especially for new fences with posts spaced far apart, and if some or all of the posts are replaced by fiberglass posts. High quality plastic insulators are also available for metal T-bar posts and small diameter steel rods.

Fence Testers

Some methods of determining the amount of power on an electric fence is desirable, especially where fences are used for predator control. Testers are also very useful to find shorts in long, elaborate electric fences.

Three basic fence testers are available as follows:

1. Voltmeter with a digital readout or a needle that is deflected.

2. Neon lights. The intensity of light gives an indication of power on the fence; bright purple for high voltage (about 2000 or more) and faint yellow or orange for low voltage.

3. Insulated wire or blade of grass. The length and intensity of spark obtained is directly related to the amount of power on the fence.

Fence design and costs

The approximate cost per mile of different types and designs of electric fences has been determined and compared with conventional fences. The costs include posts, wire, and all accessories, but not the cost of the fencer, or labour.

The cost of materials used in these calculations are as follows:

- Wood posts 3 - 4",6 ft — $2.70
- Wood posts 4", 7 ft — $3.60
- Manova barbed wire — $34.50/80 rods (1/4 mile)
- Double strand extra heavy barbed wire — $49.50/80 rods
- High tensile 12 1/2 gauge wire — $79.00/3800 ft (approx. 3/4 mile)
- 13 gauge galvanized wire -- $80.00/4600 ft.
- 16 gauge galvanized wire -- $29.00/2640 ft. (1/2 mile)
- Baygard IX — $71.25/80M (2625 ft.)
- 6 strand polywire — $35.00/500M (1641 ft.)
- Heavy duty nail-on insulators — 26¢
- Porcelain or fiberglass corner post insulators — $1.45
- Fiberglass posts (3/8" x 4 ft.) — $1.10
- Wire clips for fiberglass posts - 18¢
- Galvanized line clamps — 45¢
- Hayes permanent wire tighteners -- $2.35
- Hayes permanent wire tightener handle — $6.25
- Hayes insulated permanent wire tightener — $3.75

A. Permanent Fences

1. Manova barbed wire - 3 strands, using 4", 7 ft. wood posts 1 rod apart, cost/mile $1600.00.

2. Double strand heavy duty barbed wire - 3 strands, with wood posts; cost/mile - $1800.00.

3. High tensile 12 1/2 gauge smooth wire

a) One strand - about 35 inches above ground for older cattle and horses (refer to Figure 9 for construction) details for 1 to 3 strands, including a corner. Where ground conditions permit, small wood posts are spaced about 150 ft. apart, and 3/8", fiberglass posts every 50 ft. between the wood posts. One permanent tightener is required for each half mile; cost/mile - $360.00.

b) Two strands - both electrified at 18 and 35 inches above ground for cows and calves; or one grounded, about 8 inches above the electrified wire for older cattle under drought conditions. The cost/mile is about $505.00.

c) Three strands - each spaced 12" apart for cows and calves under dry conditions. The top and bottom strands are live and the middle wire is grounded, with cost/mile of about $635.00.

4. 13 gauge galvanized wire - for permanent dividing fences. Construction details are the same as for high tensile wire fences, but the cost per mile per strand of fence is about $20.00 less.

5. Used telephone wire - where available, could reduce the cost per mile per strand of wire by about $90.00 compared with high tensile wire.

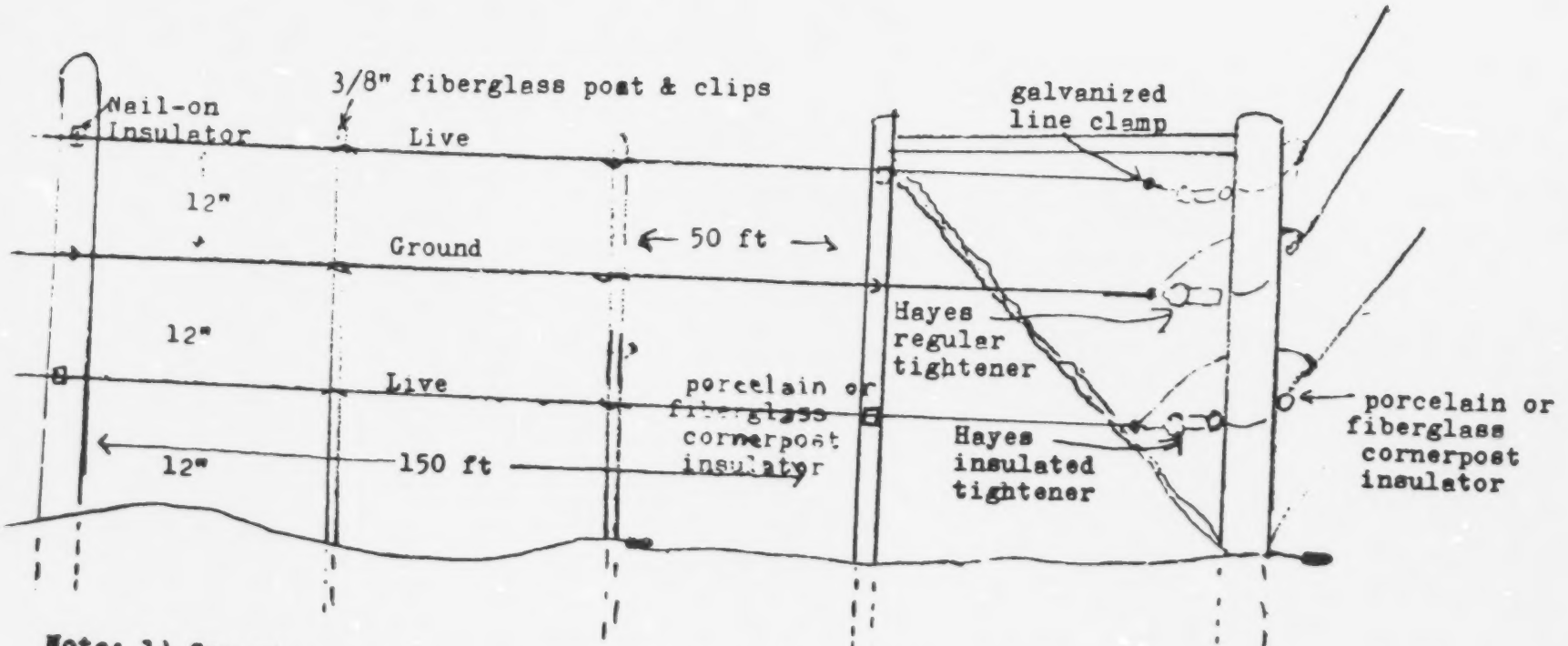
6. Electrifying existing fences - one or more strands of smooth wire can be attached to the existing fence posts with plastic nail-on insulators and electrified. Offset brackets with insulators can be used to hold the electrified wire about 9 inches away from the existing fence or corral. On level ground, one offset bracket is used about every 100 ft., at a cost of about $1.50 each. One or more wires on the existing fence can be grounded for drought conditions.

Note: All wires on permanent electric fences should be loosened somewhat during winter to prevent damage to the fence by heavy snow load and very cold temperatures. The wires are easily and quickly loosened with the use of permanent fence tighteners. The alternative is to use a spring on each section of wire. The cost of springs commercially available is about $10.00 each.

B. Temporary Electric Fences

Construction design is simpler and

Figure 9. Permanent electric fence for cows and calves.



Note: 1) Guy wire on corner brace should be covered with plastic or held away from electrified fence wires.
2) Live wires bridging across the corner and top and bottom wires can be covered with plastic (insultube).

cheaper than for permanent fences. Wood posts can be replaced by 3/8" fiberglass posts, except at corners and not on very rough terrain if there is much tension on the wire.

1. 16 gauge galvanized wire - where conditions permit 3/8" fiberglass posts are about 100 feet apart. One permanent tightener can be used on one mile or more of wire. The cost per mile for one strand is about $143.00, and for two strands is about $218.00.

2. Baygard IX - Fiberglass posts can be about 75 feet apart, and the wire is hand tightened. The cost per mile for one strand is about $245.00, and for two strands is about $400.00.

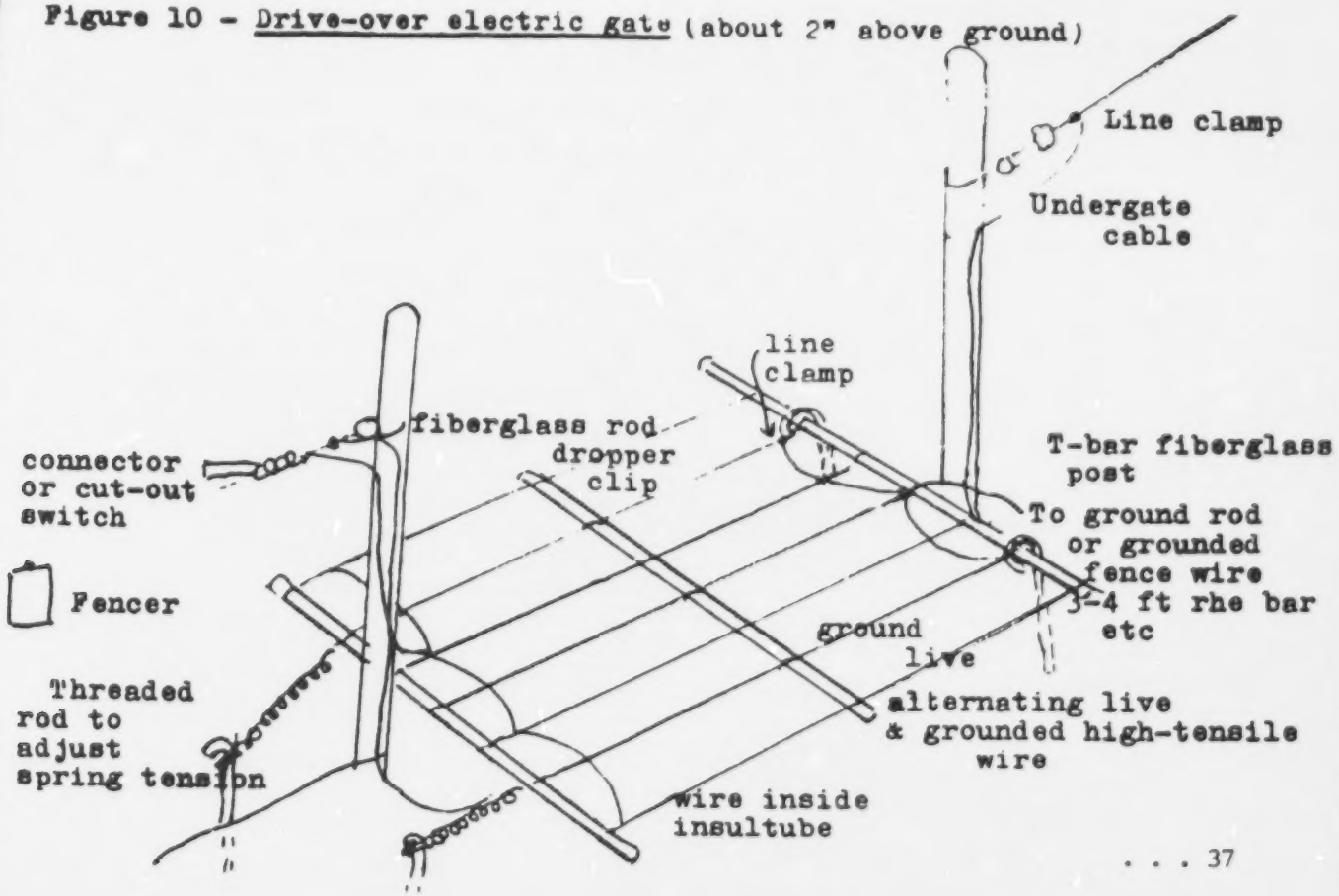
3. Polywire - with six strands stainless steel wire. Fiberglass posts can be about 50 feet apart, and the polywire hand tightened. No more than one mile of six strand polywire can be charged by a fencer. Furthermore, the fencer should be placed in the middle of the fence so that the current can travel both directions. The cost per mile of one strand of polywire is about $260.00.

If the temporary fence is to be moved periodically, and if it is in lengths of one-half mile or less, large insulated reels can be used on each wire. The wire is then quickly and easily moved, kept tight, and rolled up for storage. The cost of the reel is about $34.00.

Gate Designs

If there is a lot of stock pressure at a gate, it is preferable to use a conventional wire, wood or metal gate. Under other circumstances electric gates can be constructed that are low-cost and effective. Three basic designs are described below.

Figure 10 - Drive-over electric gate (about 2" above ground)



1. Drive-over Electric Gate (Figure 10). This gate consists of alternating live and grounded wires (preferably high tensile) stretched between two fiberglass T-bar posts. A 3/8" fiberglass rod is placed in the middle of the gate and attached to the grounded wires. On very wide gates more than one fiberglass rod could be used. Insultube (plastic hose) covers the wires connecting the electrified wires at one side, and the grounded wires at the opposite side of the gate. The live and grounded wires must not tough; if they do the fencer is shorted out.

   The gate is held in place by one-half inch steel rods driven into the ground, and two springs attached to one side of the gate. Underground cable, buried inside plastic hose, is used to conduct electricity across the gate. A flexible connector or cut-out switch is used to disconnect power from the gate, if necessary.

   The cost of materials for a 15 feet drive-over gate is about $30.00, excluding the metal rods and plastic hose. A New Zealand-made polyrope electric gate, which can be driven over, or stood upright, costs about $85.00.

2. A three-wire permanent electric gate - is illustrated in Figure 11. More or less wires, with or without grounded wires can be used for the gate. One or more 3/8" fiberglass rods are used to keep the wires spaced properly. The wire to bridge power between top and bottom wires is covered with plastic to prevent shorting out on the middle grounded wire. A flexible connector or cut-out switch is used to disconnect power from the gate. Underground insulated cable and a ground wire (if one is used on the fence) are buried inside plastic hose. This allows the gate to be open without affecting power on the fence.

Figure 11. Permanent Electric Fence Gate (cattle, all ages)

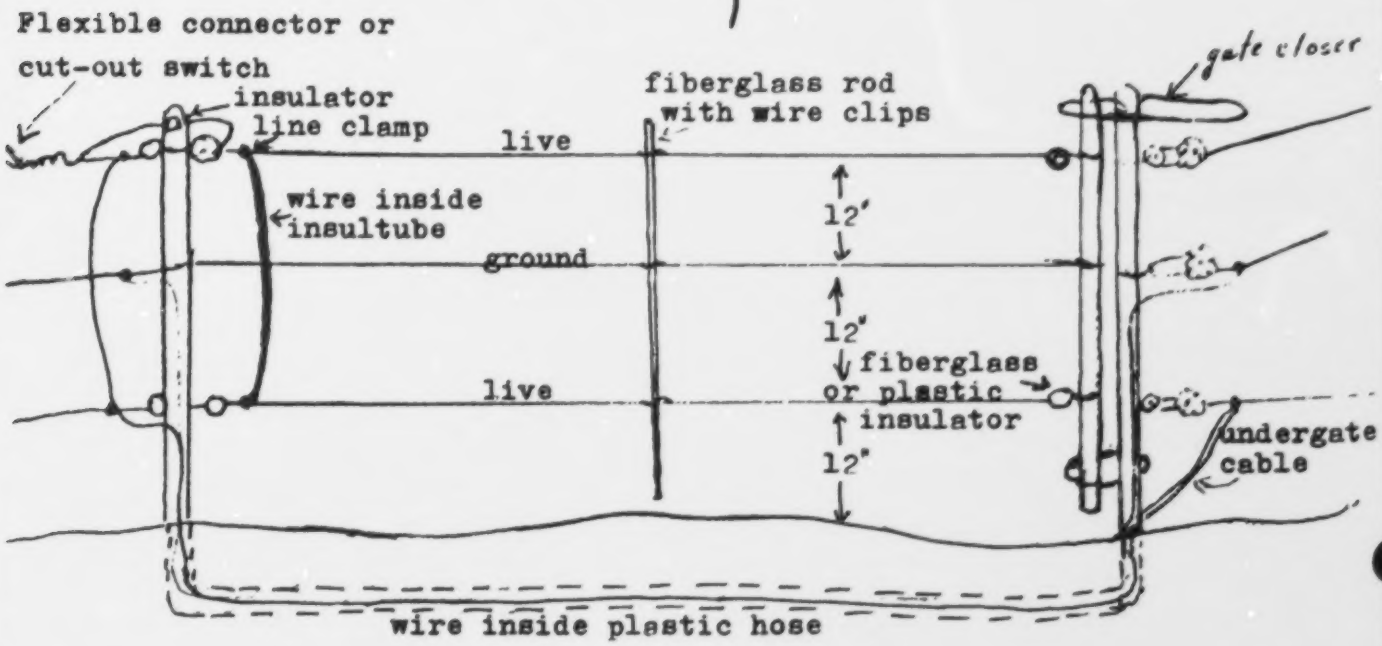
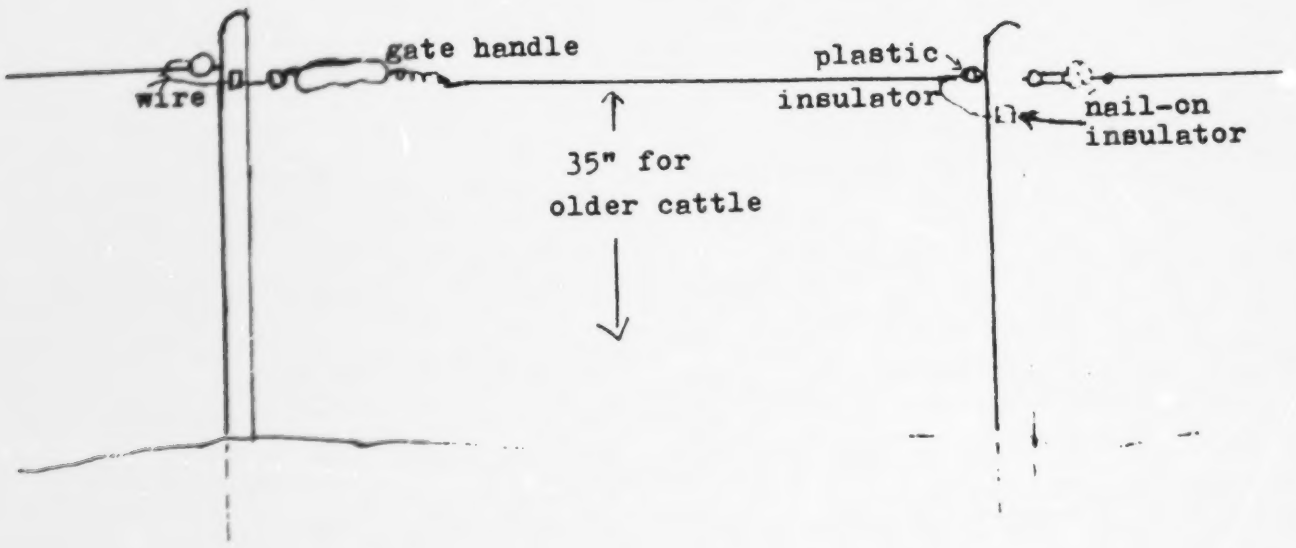


Figure 12 Temporary electric fence gate



The material cost for a three wire, 25 foot gate, excluding wood posts and plastic hose, is about $33.00. This includes a gate closer, so that the gate is very easy to open and close, and yet keeps considerable tension on the wires when closed.

3. A temporary electric gate is shown in Figure 12. A good quality spring-loaded electric fence gate handle currently costs about $4.40. If there is a long distance of fence wire to be electrified beyond the gate handle, power should be connected across the gate either underground or overhead. This provides a much better contact for flow of current than through the gate handle.

REFERENCES

More detailed information could be obtained from the following:

1. Prairie Agricultural Machinery Institute, Box 1900, Humboldt, S0K 2A0 (Fencer evaluation reports).

2. Electric Fencing Manual for Alberta, Alberta Agriculture, 7000 - 113th Street, Edmonton, Alberta, T6H 5T6.

3. High-tensile Smooth Wire Fencing Manual for Alberta. Alberta Agriculture, 7000 - 113th Street, Edmonton, T6H 5T6

4. Electric Fencing Manual, B.C. Ministry of Agriculture and Food, Victoria, B.C.

5. High Tension High Tensile Fencing, Agriculture Canada, Range Research Station, 3015 Ord Rd., Kamploops B.C., V2B 8A9.

RED MEAT MYTHOLOGY

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In the last several years many myths have been propagated about the red meat industry. Meat will kill you. Cholesterol will get you. The media jump on the bandwagon. As responsible citizens you are no doubt concerned about the possibility that some of these statements may be correct and that we should decrease or eliminate the consumption of certain kinds of foods that we're in the business of producing. Those of us in the Canadian Society of Animal Science were very concerned about this.

Dr. Brisson, a nutritionist who holds a joint appointment between Agriculture and the Faculty of medicine had the courage to produce a book on these myths "Lipids and Human Nutrition". It is a very controversial book on fats, cholesterol, heart disease, cancer and so on. He did a very extensive review of the literature and came up in many cases showing vast differences between what the public is being led to believe and what the experiments that the facts were based on actually proved. It really challenges some of the long held beliefs. The Canadian Society of Animal Science had Dr. Brisson add more information on recent literature and came out with a positive statement. However, anything that this Society says or you say to try to counteract the kind of garbage that's in the popular press, is not likely to get very far because we can be accused of having a bias. But in the last little while medical people from around the world are beginning to look at some of the statements being made. So I don't come here today to tell you what I or the Canadian Society of Animal Science think. The important thing is to relay what the medical profession is thinking. That will make more mileage than other things that WE could do that may be regarded as biased.

Here are the basic concerns of nutritional misinformation. I want to deal with:

"Natural", "organic", "health" foods
Vitamin megadoses
Vitamin B15
Vitamin B17 (Laetrile)
Antifluoridation
Animal Fats
Animal Protein
Cholesterol

When it comes to natural, organic or health foods, some of you are, no doubt, believers. Part of that group of Canadians that spend several billion dollars yearly on high priced food that won't do you any good but will keep money moving in the economy. We could discuss for several hours any one of these topics but I'll concentrate on the last three as they are of most interest to cattle producers.

Life Expectancy

I would like, by way of introduction to say a few words about life expectancy. After all, when you read the articles in the popular press you'd wonder if your days are numbered. According to the World Health Organization in 1983, in Canada, U.S.A., Europe and Australia, which are fairly heavy meat eaters, life expectancy is 70 years or more. The same report, but not quite in these words, indicates what the life expectancy is in countries where they don't indulge in these horrible practices of eating meat (eat a healthy diet) and live for 55 to 65 years. We can go back a little bit in history. "In primitive times, lack of food gave languishing bodies to death; now it is abundance that buries them." That was stated in 50 B.C. by Lucyetius. In 1986, same problem. We've got too much prosperity; eat too much and that tends to shorten some lives.

Figure 1, from a Metropolitan Life Study in 1971 shows you what people die of - from birth to 80 years of age - and the percentage of deaths from the various causes. You'll notice accidents account for most deaths under 40. You'll also notice that by the time you reach your latter years you essentially have a choice between coronary heart disease, heart attack or stroke, and cancer.

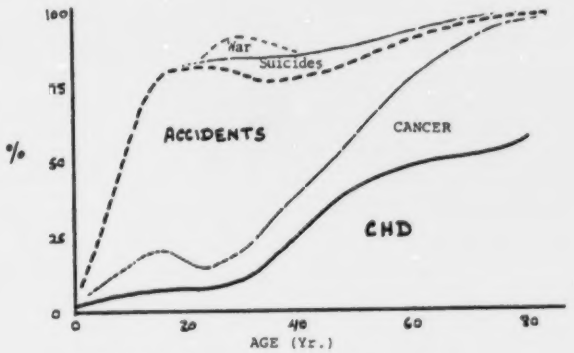


FIGURE 1: Percentage of deaths by causes (1971, Metropolitan Life)

But, there's another angle to that that's rather interesting. Figure 2 shows a decline in death rates from 1968 until about 1982 the non-cardiovascular disease component, is a collection of many things and don't worry about it. From 1968 onward there has been a steady decline in the incidence of coronary heart disease, coronary vascular disease and stroke and to a large extent we can put all of these in the same category for our purposes today. You may think this is contrary to the previous slide which simply identified that you had about an equal chance of dying of cancer or heart problems late in life- something's got to take you. But, this is showing that despite all that we've heard about the bad eating habits and so on that we've been practicing over the last 20 years or so, coronary heart disease incidence is steadily going down.

Health and Welfare Canada's 1981 statistics for causes of mortality in men ages 35-69 show coronary heart disease causing 42 percent of deaths and cancer about 30 percent. Lung cancer accounts for over 10 percent of deaths.

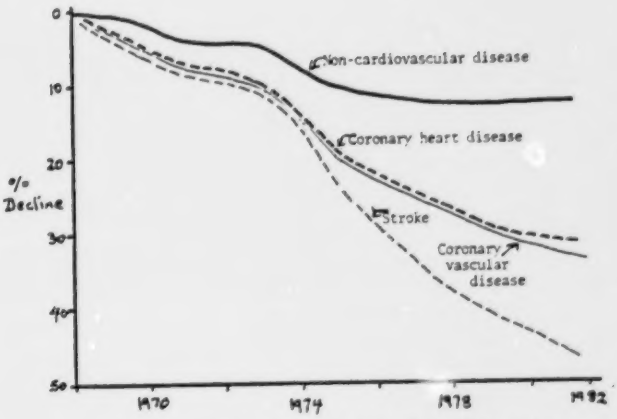


FIGURE 2: Decline in Death Rates from 1968, U.S.A.

Table 1: Causes Of Mortality In Canada, 1981
Men Ages 35-69 Yrs.

All Causes	100%
Coronary heat disease	41.7%
Cancer, all	29.4%
Lung cancer	10.5%
Chronic lung disease	3.7%
Cirrhosis of liver	4.5%
Motor accidents	6.8%

Life insurance companies make a very marked distinction between smokers and non smokers of all ages (table 2). Smoking turns out to be a more significant factor in relation to coronary heart disease than some of the problems like cholesterol. For a 25 year old man to take out a $100,000. policy if he's a non-smoker he can get that for $244 a year, if he's a smoker, $378. That is indicative of the degree of risk that the insurance companies are associating with the smoking habit.

Table 2: **Annual Life Insurance Premiums Per $100,000. Policy ($)**

AGE	SMOKER	NON SMOKER
25	378	244
35	659	384
45	1277	717
55	2323	1439

Women live longer than men as the next table shows us (Table 3). The columns indicate the number of years of life

TABLE 3: Annual Death Rate Per 1,000 And Years Of Life Expectation For Men And Women Of Different Ages.

Present age	Men		Women	
	Annual death rate/1000	Expectation of life (yr.)	Annual death rate/1000	Expectation of life (yr.)
0		70.3		75.3
25	1.77	47.3	1.16	51.8
35	2.11	38.1	1.65	42.5
45	4.55	29.1	3.56	33.4
55	10.47	20.8	7.09	24.8

Table 4: Consumption Patterns, Canada

	'63	'80	'82	'84
Red meats, kg	63.3	74.9	72.0	70.4
Beef, Kg	33.7	39.5	40.5	38.3
Chicken, Kg	8.9	17.2	17.3	
Eggs. kg	14.6	12.9	12.8	
Animal fats, kg	11.8	4.5	4.3	
Vegetable fats, kg	10.5	17.8	18.4	

you can expect to have on average at these particular ages. The one problem that we have in giving full equality to women is to figure out how we can shorten their lifespan.

Consumption Patterns

Table 4 gives consumption patterns for various meats in Canada for 1963, 1980, 1982 and 1984. In the case of red meats, you can see 63 kgs in 1963 up to 75 kgs, dropping to 72 kgs, dropping down a little bit to 70 kgs in 1984. Beef, is fairly stable according to this study. The consumption of chicken has doubled from 1963 to 1982 and I think it was up even further in 1984. Egg consumption has been dropping down. The consumption of animal fats has been dropping to nearly a third of the consumption in 1963. Vegetable fats approximately doubled. Keep these figures in mind as we walk through some of the subsequent comments that I will make.

Table 5 is a study of Canadian families grocery purchases. It may differ from annual per capita consumption which is industry disappearance figures. Nor does this show consumption of meats outside the home. This table is the basis for some of the substantial concern in the red meat industry. In the period from 1974 to 1982 the family purchase of beef dropped 15 percent, pork dropped 51 percent, chicken went up 35 percent, fish went up 12 percent, whole milk down 40 percent, cheese, depending on the kind of cheese up from 14 percent to 96 percent, eggs down 16 percent, butter down 27 percent, margarine up 17 percent. These are some of the changes that are taking place.

Table 5: Change in Animal Product Purchases by Canadian Families, 1974-1982.

Beef	-15%
Pork	-51
Chicken	+35
Fish	+12
Whole Milk	-40
Cheeses	+14 to +96
Eggs	-16
Butter	-27
Margarine	+17

Now, lets zero in on some of the alleged culprits in our food supply:

Cholesterol
Fatty acids
P/S ratio
Lipoproteins (HDLP, LDLP)

The PS ratio is the ratio between polyunsaturated fatty acids and those that are saturated. Lipoproteins, are combinations of fats and proteins that exist in the bloodstream. In a super simplistic fashion they represent an emulsifier and enable fats to be carried in a water medium. The lipoproteins contain cholesterol as well as protein. The HDLP and LDLP refer to high density and low density (specific gravity). These different types of lipoproteins are extremely important and are the centre of much of the interest at the moment in what to do about cardiovascular disease.

Cholesterol

Cholesterol is not all bad (table 6,). Cholesterol (figure 3) is synthesized in the body. It's a necessary component of the body and synthesis is the dominant factor. It is involved in bile acids which are essential for the absorption of fats and fatty acids and some of the vitamins. Cholesterol is involved in the production of the hormones of the adrenal cortex and certain sex hormones. One type of cholesterol can be converted into vitamin D by the action of sunlight on the skin. The blood, liver and vessels contain about 15 percent of the body cholesterol. The rest of it is in other parts of the body. Our main concern about cholesterol in human health, of course, is when it runs awry in the bloodstream.

Table 6: Function of Cholesterol in the Body

* Bile acids
* Adrenalcortical hormones
* Sex hormones
* Vitamin D
* Blood, liver, vessels - 15% of body cholesterol
* Synth. in body

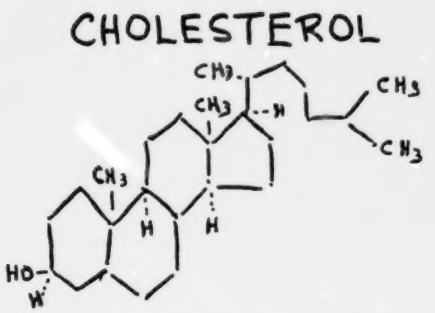


FIGURE 3: Schematic Diagraom of Cholesterol molecule ($C_{27}H_{46}0$)

Fatty Acids

Fatty acids are part of the concern we have in animal foods and by way of explanation here are some examples:

a) CH_3 - COOH - short chain, saturated.

b) CH_3 - $(CH_2)_X$ - COOH - long chain saturated

c) CH_3 - $(CH_2)_X$ - CH = CH - COOH - long, unsaturated

C16:0 Palmitic acid
C18:0 Stearic acid
C18:2 Linoleic acid

The short chain fatty acid is acetic, the primary ingredient in vinegar. All fatty acids have that carboxyl (COOH) group on the end. The chain is lengthened out by adding carbon molecules in them (X above means any number). The single bar connecting the carbons (eg. b) means it is saturated, the double bar (eg. c) means unsaturated.

The "double bonds" as they are called are very important to the nature of the fat. At room temperature a fat may be solid. If you had the same type of fat generally except that there was a number of double bonds in the fatty acids, it might remain liquid at room temperature. So it has a bearing on the texture of the material and the quality and how it might be used in the food industry.

We can have long chain unsaturated fatty acids with several of these double bonds. A couple of these long

chain fatty acids are essential nutrients. These are the polyunsaturated fatty acids being pushed in merchandising - corn oil, sunflower oil, safflower oil and so on.

While it's desirable to have a certain amount of polyunsaturated fatty acids in the diet, there is evidence that certain types of cancer can be speeded up if the polyunsaturated intake becomes too high. If an oil, like sunflower oil or corn oil is hydrogenated, these double bonds change to single. That hardens them so they can make a spreadable margarine out of corn oil by hydrogenation. Keep in mind that you've not just changed the physical texture, you've changed the whole nutritional value of it as well. You have now moved an oil into a solid fat and it will lose some of its properties - nutritional and otherwise.

Table 7 describes the fatty acid content found in food fats and oils. The saturated fatty acids that are present are quite low in products like corn oil, safflower oil. They're fairly high in butter, they're fairly high in beef fat. When people condemn butter and beef fat, they generally are condemning them on the basis of high saturated fatty acids. But, there's as much saturated fatty acid in palm oil as there is in animal fats. Look at coconut oil - 92 percent - twice as much saturated fat. If you look at some of the margarines that you buy or some of the coffee whiteners you will notice many of these will say **may contain coconut oil.** They don't say any more, but that's on there for a good reason. Health authorities want people to note that they're there, but a lot of people don't realize the significant of the statement. People are getting away from butter fat which might be in cream or cream milk to escape the unsaturated fatty acids and going to a coffee whitener with coconut oil as the main ingredient.

In table 4 we saw that animal fat consumption was going down while vegetable fat was increasing. How much of that vegetable fat is high in saturated fats, naturally like coconut or palm oil, or from hydrogenation like corn or canola oil to make margarine? What I'm trying to do is give you some items to put in your shopping basket so that you can react more effectively when you are challenged about why you are in the beef business or the dairy business and producing these harmful foods. Let's get the record straight!

Table 7: Fatty Acid Content in Food Fats and oils, %

Product	Lino-Leic	Palm-itic	Stearic	Total Sat.	Total Unsat.
Corn Oil	57	11	11	13	83
Safflower Oil	73	6	3	9	86
Palm Oil	9	42	4	48	48
Butter	2	21	10	50	26
Beef Fat	4	25	18	48	47
Coconut Oil	4	9	3	92	8
Sunflower Oil	63	7	4	12	87
Canola Oil	20	3	2	5	94

Framingham Study

The often quoted Framingham study was completed in 1961, so is 25 years old now. They identified from the study of many thousands of patients the major risk factors in coronary vascular disease as: serum cholesterol, elevated blood pressure and cigarette smoking. This as far as I know, remains unchallenged.

Multiple Risk Factor Intervention Trial (MRFIT)

In this study, 12,8000 men at high risk were studied. Half were left on their usual diet. The other half were told to avoid animal products and reduce cholesterol. After seven years they found blood cholesterol reduced by only two percent. This study suggests, quite clearly that a very limited amount can be achieved by reducing the cholesterol in the diet. I think it is essentially saying that even for these high risk people it is not so much the intake as synthesis and control of the level of cholesterol circulating in the system that matters. It's agreed, as I mentioned earlier, that high cholesterol in the blood is a problem but it's certainly not agreed that diet contributes much to that. They found that in the half who avoided animal products and reduced their cholesterol there was no reduction in mortality or incidence of coronary heart disease.

Ireland-Boston Study

There's always been interest in why some countries had low incidence of cardiovascular disease and others had a high incidence. They had the opportunity to study about 1,000 men in three groups, more or less equal - some men who were born and raised and spent their lifetime in Ireland. There were some who were born in Ireland but moved to Boston. And some who were of Irish decent, born in Boston and stayed there. They were able to get good dietary histories and medical histories on these people. They were able to conclude that a reduced intake of saturated fats and cholesterol reduced coronary mortality. Right there, notice that there are two factors. Was one effective? Were they both effective? Did they both have to be there as a pair to be effective? Is there a risk of misinterpretation? We don't know.

A small reduction in the rate of coronary lesion growth gives major delay in death from coronary disease. As an example someone who dies at 40 years of age may have had something like three percent of lesion growth per year for a 20 year period. It is a fairly fast rate of growth. Someone who dies at 80 years of age of coronary vascular disease probably had a much slower lesion growth. It's particularly significant that the medical profession, feels that the development of coronary heart disease to the critical point is something that requires a long time to generate. It sort of reflects a lifetime of lifestyle whatever that may be and maybe it goes all the way back to that Greek statement which talks about us living a little too high on the hog.

NIH (LRC- CPPT) 1984 STUDY

The National Institute of Health in the U.S.A. conducted a study in 1984 at the LRC-CPPT (lipid research centre - coronary primary prevention trial). This is the most recent study dealing with the cardiovascular concern. You can appreciate the desire of public health institutions to take a serious look at a health situation that is taking 40 percent of people as a cause of death.

They looked at some 480,000 people from various clinic records across the US and selected 3,800 of them for a 7 1/2 year, $155 million study. These men, between 35 and 39 years of age, were hyper-cholesterenic. That is they had plasma cholesterol levels above 280 mg/dl (0.5 percent of men in that category of the 480,000 studied).

They had these people all go on a low cholesterol, low calorie, low saturated fat diet for a period of three

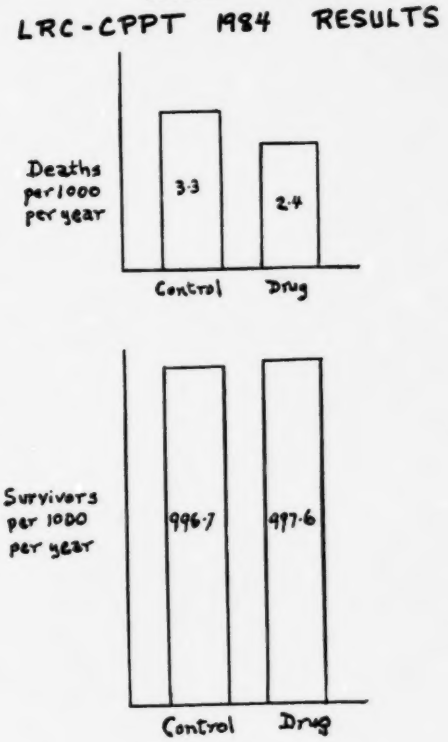
months. I'm not quite sure why because in the preamble of their report, they acknowledged that previous studies had indicated little likelihood of being able to modify cholesterol by dietary means. Then, they took half the men and gave them a drug, cholesteramine, which is designed to reduce blood cholesterol. It was known before this experiment started that cholesteramine would reduce the level of cholesterol, but they wanted to get the study conducted on a large number of people to really prove it.

Now what happened? Three thousand and eight hundred men; about 1,900 roughly on control and 1,900 on the drug; deaths from heart disease - the controls had 3.3 deaths per thousand from heart disease; the drug - 2.4 per thousand. Since there was .8 fewer per thousand on drug they reported this as a 27 percent reduction in risk. That made me just a little bit nervous when I saw it because that's not quite the way we go about things. Look at Figure 4. If you look at deaths per thousand per year from coronary heart disease - 3.3 with no drug, 2.4 with the drug. That's a 27 percent reduction. On the other hand, if you look at the survivors 996.7 and 997.6 doesn't give you much to choose from.

Some have hailed this study as the final proof that if you reduce cholesterol in your diet you could decrease coronary heart disease and increase your life span. But that is not what the project set out to prove, and the experimenters made that quite clear. In their preamble they said that evidence that reducing cholesterol intake of diet effectively reduced blood cholesterol was inconclusive.

Yet this was the study that led to the media putting out reports that I mentioned earlier. Who are we to stand up and tell the medical profession or tell the media for that matter that they didn't put the right interpretation on this. Finally, out of some 27 prominent medical authorities around the world, who were invited by the editors of the science magazine, Nutrition Today, 17 of them responded. They criticized everything from the experimental design to the interpretation of results and through to the publicity.

FIGURE 4: Deaths or Survivors Per Thousand Per Year



The experiment was never set up to prove that reducing dietary cholesterol would reduce blood cholesterol and it did not prove it. They are even questioning whether the drug itself has enough effect to warrant its use. And they are not prepared to buy the publicity promoted by the researchers themselves and the press.

Zutphen Fish Study, Holland

There are increasing reports to indicate that fish is a lot better for you than red meat. What about it? A study was done in Zutphen, Holland, where there was essentially no interference with the people involved. They were able to find 852 who were observed over the 20 year period from 1960 to 1980. Approximately half these men in this study just wouldn't eat fish. So they

studied them and their wives pretty carefully to determine eating patterns; followed the health and mortality. They found that fish eaters had over 50 percent lower mortality than non-fish eaters. From the amount of fish these people were eating, they said that two or more fish dishes per week may be of preventative value in coronary heart disease. Not a very big study but rather interesting.

Oregon Study

A very small study was done in Oregon with 20 patients who were hypertriglyceridemic (high blood fat levels). This is something you don't want in a patient with potential coronary problems. They put 1/3 of them on a fish oil supplement and found a 27 percent reduction in cholesterol and a 64 percent reduction in triglycerides.

This and the Holland study are very small but researchers will explore it. Some feel a particular fatty acid, "EICOSAPENTAENOIC" acid, (C20:5) a long chain polyunsaturated fatty acid with five double bonds, may be a protective factor. I'm not saying it is, but if it is a protective factor it may be a small step to either isolate that, fractionate it from fish oils or perhaps synthesize it from other materials. Perhaps a small percentage of that could be put into products like margarine, coffee whiteners, who knows what and it may provide some protection. These people, I believe, feel that there's some component in here that is giving the blood vessel some protection against the development of the abnormal depositions that lead to the eventual plugging of the pipes and blockage and heart attacks and by-passes and all the things that go with it.

Cholesterol Sources

Cholesterol has been mentioned quite frequently in this paper. Where do we get it. Here is the cholesterol content of equal portions of meat:

Beef - 73 mg.
Pork - 79 mg.
Chicken - 76 mg.
Turkey - 60 mg.
Flounder - 52 mg.

Beef, pork, and chicken are all about the same. Cite these figures next time someone tells you chicken is better than beef. Turkey is lower, fish is lower. There are, however, significant differences in the amount of fat (table 8) when people consume these products. Lets compare round steaks, roast chicken and chicken nuggets. Chicken nuggests are the success story in the poultry industry and largely responsible for the increase in poultry meat consumption.

Chicken nuggets have twice as many calories and three times the fat of round steak. Why - because of the coating and how it is cooked. Cholesterol -about the same for all three but sodium is very very high in the nuggets.

Table 8: Nutrient Content Per Serving

	Beef round steak	Roast chicken	Chicken nuggets
Energy kcal	173.	122.	314.
Protein gm	29.6	21.0	20.3
Fat gm	6.0	3.0	19.0
Energy from fat %	31.	22.	54.
Cholesterol mg	82.	71.	76.
Sodium mg	69.	59.	525.

Fat Content of Food

Many of us have felt, that particularly in Canada, where we have introduced new grading systems, and have moved both beef and hogs toward leaner carcasses, that some of the information being used in the magazines and even by some health professions did not use up-to-date information.

A study in Guelph (table 9) compared current Health and Welfare data with their own meats lab data using modern comparable cuts. They showed a substantial reduction in the fat content from Health and Welfare figures: 20 percent for sirloin, 52 percent for round, 36 percent for rib roast, 60 percent for rump roast. And keep in mind most people remove 70 percent of visible fat before eating.

Table 8: Fat Content of Cooked Beef (Guelph Study)

Cut	H&W	Guelph	% Diff.
Sirloin steak	27.7	22.2	19.8
Round steak	15.5	7.4	52.2
Rib roast	36.7	23.5	36.0
Rump roast	23.3	9.3	60.1

Nutritional Advantages of Meat

We have to promote information about the superior quality of protein (amino acid array) in meat compared to plant products. People who depend too extensively on vegetable protein could run into some difficulties in this regard if they aren't selecting very carefully. Animal products are very rich sources of B vitamins, particularly, vitamin B12 and of the vitamin niacin or nicatinic acid. I'm not sure that vitamin B12 occurs at all anywhere in the plant kingdom. I'm not entirely sure how the vegetarian gets by on this account. Meat products are very rich sources of calcium, of zinc, and of iron.

The Facts

So, if we want to bring this thing into focus maybe a bit more, let's look at some of the facts as we seem to know them. Saturated fat is cholesterolemic; that is, it has been shown to increase the risk of forming cholesterol. I would emphasize again that there is no evidence to indicate that the saturated fatty acid content of the diet will increase the serum cholesterol in most people. It is in the small percentage of people whose control of the synthesis and excretion of cholesterol in the body has gone awry.

The important thing is to diagnose through medical checks and so on whether an individual has high cholesterol and if he does then you want to be particularly careful about this because in those few individuals who have a tendency to high cholesterol, saturated fat may aggravate it. Animal fat has more saturated fatty acids than vegetable oils as a rule. But, coconut oil and palm oils are more saturated than animal fats. Hydrogenation increases saturation so that hard margarines may be far more cholesterolemic than animal fats.

There's evidence that animal protein is somewhat more inclined to promote high cholesterol than vegetable protein. The important thing is that somebody, several workers, getting a cue from that aspect compared mixtures of animal and vegetable proteins and found that they did not increase cholesterol.

One bit of advice that some have given is that **the solution is moderation not martyrdom.** In other words, Canada's Food Rules; they're still very valid. The accepted recommendations is a combination of Canada's food rules and some other recommendations for healthful lifestyle and long life. A nutritious diet chosen from the four basic food groups: carbohydrates, fruit and vegetables, milk and meat. Body weight control is important. Non-smoking: many of the research studies that have been carried out have indicated smoking as one very clear factor involved in coronary heart disease. And getting an appropriate

amount of exercise.

And, we can come back finally to a statement that was made in 1980 by the Food and Nutrition Board in Washington after extensive study of the evidence up to that time, they said that reducing cholesterol intake is not an effective way of lowering plasma cholesterol. Recent evidence has not changed this view. It comes back again to putting emphasis on the Canada Food Rules.

HOW THE BEEF INDUSTRY CAN MEET CONSUMER DEMAND

Carolyn McDonnell
Beef Information Centre (BIC)

I've been asked to bring to you the message conveyed by three speakers at BIC's Beef Industry Seminar last fall. Over 150 key industry leaders met in Toronto in September to hear experts in Beef Marketing outline a Strategy for Success for the Beef Industry. The basis of this message was "Listen to the Consumer".

Why? Until recently, agricultural commodities have not had to be concerned about the needs of consumers. It was enough to produce a good product and simply get it out there. The ever-increasing population had to eat and they were glad to have good food at reasonable prices. But it's not the same any more. The population is no longer growing, there's lots of food and lots of choices - not just the traditional choices - we're eating lots of non-traditional protein foods, vegetable proteins, cheese, soy, etc. Imported fruits and vegetables have expanded our horizons and our taste buds and ethnic foods are also much more sophisticated and the consumer is much more knowledgable about the food he/she eats. They want wholesome, nutritious, additive free convenient food that's good value for their money - quite a shopping list!!

What this has meant is that agriculture commodities have had to work harder to retain their share of the marketplace - they have had to become marketers, not just producers. Being a marketer means understanding and meeting the needs of your customer because if you don't, someone else will and there goes your market.

Psychographic Study Of Consumers

In order to better understand the consumer, BIC has conducted several research studies. We have analyzed not only our own consumer research, but also that from the U.S. and even Australia, as well as research from a variety of sources, conducted by various methods. All leads in much the same direction. Consumers are changing. They are becoming very health conscious, price is not the issue it was in the early 80's, convenience is important, as well as new and exciting tastes. The trends all point in the same direction. In order to really understand our customer we conducted a psychographic study last spring of consumers in eight different cities across Canada.

I might add that this study is an adaptation of a similar study that was done in the U.S. two years ago by a very large research firm. What we did was take virtually the same study and repeated it in Canada to see if we compared to the U.S. and the results were very, very similar.

This information was presented at our study in Toronto by the head of the research house that conducted it. The study found that consumers in Canada fall into four very different groups (Table 1). The largest group is the **health driven** at 31 percent. Secondly, are the carefree cooks - 25 percent. Convenience oriented represented another 25 percent. And, the smallest group of all were the meat lovers at 19 percent. Saskatoon had an above average percentage of health driven. It was up at 35 percent compared to the national average of 31 percent. Toronto, is a real problem for the beef industry. Not only does Toronto have a very large percentage of health driven, they also have a large percentage of the convenience oriented and the meat lover group was at only 11 percent in Toronto.

The **health driven consumer** was extremely conscious of all health or nutrition aspects of food. They were concerned about things such as additives, fat and cholesterol, salt, calories, and so on. They had

. . . 50

generally cut down on their use of meat because they felt it wasn't good for them and most seriously of all they did not miss it. Lastly, convenience and price were not factors with them. These were not issues. The main problem was one of nutrition.

The **carefree cook** was the exact opposite to the health driven. They were rarely concerned with any health or nutrition aspects except some concern about fat. They generally like meat but they were not committed to it. They liked cooking and they were not concerned about price. We feel that this group is made up of perhaps two groups, sort of the junk food types who are going to eat whatever they like and don't care about nutrition and some other people who perhaps have a more informed viewpoint on nutrition. They're going to eat a variety of all types of foods and they're not going to worry about it.

The third group - the **convenience oriented** at one-quarter of the population is not as fanatical as the health driven group, but certainly health issues were a factor. They were very conscious of fat and cholesterol, calories and salt. They enjoyed meat but they were concerned a little bit about its healthfulness. They generally looked for convenience in the foods that they bought but were concerned about price. This was the youngest of all four groups, young, newlyweds, singles and that kind of thing. They don't have the income and they are buying the more expensive, convenience foods.

Lastly, is the **meat lover group**. The shocking thing about the meat lovers is their concerns about health and nutrition were almost as strong as the health driven group. They were concerned about additives, fat, cholesterol, calories and salt. The only difference was, to this point, they had not let those concerns stop them from eating meat. They enjoyed meat and they would feel deprived without it, but they were not all that convinced that it was good for them. Here is a problem for the industry because this is our hard core, this is our major market. They are not all that convinced. They're worried about what they've heard. In fact, over 25 percent of this group said that they had already reduced some of the their meat consumption or were considering doing so.

Almost 50 percent of the people interviewed said that they did not feel that meat was a necessary part of a main meal. When they did this study in the U.S. in 1983 the health conscious group, which in Canada represented 31 percent, in the U.S. was a similar number; around 31 percent. They repeated the study in the summer of 1985. We will be doing a study in April 1986 and we hope that we have been able to at least hold the line there. Through research such as this we can target our message to specific groups. We know that they are generally between 25-44 years of age, 25 thousand + income and above average education and in the large urban centres.

Changing Consumer Needs

Drs. Tom Pierson and John Allen of Michigan State University have done extensive research into the beef industry over the past two years, for the National Livestock and Meat Board in Chicago. Their area of expertise is food marketing and retailing. Dr. Allen, also has a meat background, having been Director of Retail Relations for the American Meat Institute, the U.S. Counterpart of the Canadian Meat Council. Their report on the Challenges and Opportunities for the Beef Industry was the focus of last fall's seminar.

Drs. Pierson and Allen outline changing consumer needs as follows:

1. Health, nutrition and safety
2. Convenience
3. Service
4. Information and understanding
5. New Ethnic tastes and variety
6. Consistent quality

7. Value - not price but value

They then outlined eight challenges for the industry and pointed out the opportunities each represented.

Meeting The Challenge

A. The High Price Image of Beef

Beef, when compared with its competitors, pork and poultry, is generally more expensive, although not as much as most believe. On a cost/serving basis, a roast of beef is often as economical as roast chicken - in fact, many front quarter cuts are less expensive. But the image of beef remains high and even with improvements in productivity beef will likely remain at a cost disadvantage. Because we cannot compete primarily on a cost/price basis, we must focus our efforts on such consumer benefits as quality, convenience and nutrition. These elements add value to the product.

Value is the key to the consumer - not price.

$$\text{Value} = \frac{\text{Benefit}}{\text{Price}}$$

In other words, if the product has a lot of benefits in terms of taste, convenience, quality, nutrition, then value is greater even though the price may be the same. Instead of always thinking we must lower the price, what we must do is increase the benefits; (eg. provide better trim, more convenient products, etc.) communicate our benefits to the consumer as we are doing with our advertising and point-of-sale, etc. - nutritional messages in all this will improve the consumer value perception. Through product improvement and communications we can achieve a better value image even at a higher price.

That brings up the question of featuring, is it advantageous? Pierson and Allen believe that extensive featuring at very reduced prices only reinforces the high price image because of the gap observed by shoppers between the featured price and the regular price. Another negative implication of featuring is that it tends to increase variation in beef quality through poor cutting and trimming practices, as well as sometimes poorer quality product.

So while we must strive to find ways to reduce costs through the entire system and therefore, produce a more efficient product, we must never give in to those who say we can't increase the price. We can if we provide good value and we communicate that value to the public.

This moves into the second challenge:

B. The Beef Industry is commodity oriented - marketing is needed.

As I explained earlier it's not sufficient any more to produce a product and say "hey guys, come and get it". We have to become marketers - understanding consumer needs and moving in that direction. This means moving away from the commodity supply/price orientation of the past to a consumer driven/value orientation.

It's a very fundamental change in thinking and essential for the future success of the industry.

C. The Need for Improved Fresh Meat Packaging

New developments are underway to improve the way fresh meat is packaged both for the retailer and for the counter. Boxed beef was the one step. The next step is sub-primals pre-cut and vacuum packed so that the retailer just has to tray them. The advantage is having beef uniformly cut and trimmed therefore, better appearance for the consumer and allowing the retailer to spend less time in the back room and more time servicing the counter and the customer. A major problem yet to be solved in vacuum packaging is how to retain the bright red colour consumers expect. Vacuum packaging has many advantages but the consumer must be prepared to accept the natural purple

colour of the meat.

Eg. Chub packs, Gas Flush Pkg., Mini Sub Primals - Rib-eyes, Strips.

D. Appropriate Fat Trim and Finish for Greater Consumer Acceptance

Consumer research tells us that today's consumers want fewer calories and less fat. But we in the industry know that some finish is necessary for good quality meat. The challenge is to find the balance.

Consumers do not want to see excessive exterior fat or large chunks of fat within the meat. However, marbled fat does not seem to be a problem.

What we need is better retail trim - some in the U.S. going as far as total trim. We certainly don't need more than 1/4" fat covering. Along with this we should encourage the trend to more boneless cuts. Both better trimming and boneless beef communicate greater value to the customer. However, a third element is essential - consistent quality. Are we providing it? - or are we trying to get too lean, removing the marbling requirement in A Grade, lack of aging etc. reducing the quality of our product. Are there ways to process leaner carcasses differently, in order to improve tenderness? Certainly, some challenges here for the industry.

E. Convenience

Lifestyles have changed dramatically with over 50 percent of women in the workforce. Families are smaller and busier. People want convenience and generally are willing to pay for it. Eg. Put convenience and nutrition together and you have a best seller - eg. Lean Cuisine - has made frozen dinners the fashionable thing - not inexpensive but easy and less than 300 calories - just ask more consumers and they'll give you that line.

The beef industry has fallen behind in this area of providing new convenient beef products, - but progress is being made.

Muscle cutting
Beef Strips
Pre-Marinated Steaks
Beef Finger Food - restructured

Steinberg's in Montreal have gone to cutting their sirloin steaks in half, boning them out. They have doubled their sales of sirloin steaks. Just a very simple change and doubled their sales. That's what I mean by increasing the value of the product.

A blade steak is three different muscles in one piece of meat: a tender muscle, a medium tender muscle and a less tender muscle. The same thing in a roast. It's a problem cooking it because you've got three different tenderness areas. Why not take those muscles apart, separately, and sell each one individually. Instead of selling those 7 pound blade roasts, why not cut it differently. Muscle cut it and get a variety of cuts that are attractive, boneless, smaller portions and we can sell a lot more of it.

F. Consumers Need Information on Beef

Supermarket shoppers have difficulty making meat selection decision. This has come across in much of our research. They do not enjoy shopping for meat, because they find it confusing. They also have problems cooking various cuts correctly. The opportunity here is to provide nutrition, cost per serving and cooking instructions at retail, and also, through electronic and print advertising.

BIC's "Point of Sale" Program

The beef Information Centre has been involved for about the past four years in providing recipe stickers that will go right on the meat packages. We tend to provide recipes mainly for some of the cheaper cuts; the ones consumers tend to not understand as well as others. Stores using these recipe stickers experienced a sales increase on individual cuts between 10 and 50 percent. The stickers can switch sales from one type of meat to another. They

work very well on seasonly attractive products. Stickers dramatically increased both the number of customers purchasing the products and the total volume of beef sold.

Now, you might say "if they worked that well why don't I see them in every store?" We have no problem selling this to the Head Office people. They know and they want the program. It's getting that fellow that's got to put that sticker on at store level motivated to do it. There are a lot of stickers out there but you don't always see them because that guy behind the counter just doesn't bother putting them on.

Last month, January 1, 1986, we have come out with a calorie labelling program, based on our current advertising campaign - "Today's beef, it's leaner than you think". We have three calorie labels: 150 calories per serving, 200 calories per serving and 240 calories per serving. The 150 calories can be used on eye of round. The 200 calories is used on round, inside - outside round, rump, sirloin tip. And then the 240 calories is for your loin steaks, sirloin, t-bone, wing steaks and so on.

These calorie stickers go right on the meat packages. We feel this will be a very effective way of getting the message. "Lean Cuisine" can say its less than 300 calories; we can show them that they can have beef for less than 240 calories. This has been adapted from a program started in the U.S. called Nutri-Facts. With approval from Consumer and Corporate Affairs. The chains are very excited about the program. Virtually all the chains have ordered materials and you should start to see quite a lot of calorie labels out there.

A program we had at Christmas time was "Beef for the Holidays"; a series of recipe cards, very attractive photos and recipes at the meat counter designed to meet the need for entertaining type recipes for Christmas.

G. Image of Beef

This problem has occurred because of misconceptions regarding the fat and cholesterol content of meat substances which have been linked to heart disease and cancer, even though the evidence is inconclusive.

This misinformation was diseminated to the public through the media and through the health care community. In addition, poorly trimmed beef in the retail counter conveys a negative message to the consumer.

What are the opportunities for the industry?

- tell the positive nutrition story
- target nutritional message to key consumer segments
- better trimmed beef
- incorporate nutritional message into merchandising programs
- educational programs aimed at health care community and schools
- electronic and print advertising

BIC Meets Image Challenge

1. "Nutrition Quarterly" Newsletter

What are we doing in this area to meet this challenge? BIC about three years ago started a nutrition quarterly newsletter geared to health professionals: dieticians, nutritionists, government people, teachers, anyone involved in health care. (Not doctors but public health nurses). We have an editorial board made up of three health professionals, well respected in their field who review all the articles. The newsletter covers issues such as dietary fat, iron, carcass grading, inspection, cholesterol. We did survey a number of dieticians at last year's Canadian Dietetic Association Convention and are quite pleased with the results.

2. School Program

We direct nutritional information at the schools. A nutrition package of

material is free of charge to all family studies, home ec teachers across Canada and in addition, we're adapting this package right now for health teachers. (One of the concerns today is with anorexia nervosa. We're looking at targeting it to meet that need.)

3. "Common Sense Revised"

Last year, we did a survey of doctors across Canada to determine what their attitude was towards beef. We found 88 percent of doctors feel beef is nutritious but 84 percent felt it had a higher or a much higher fat content than fish and chicken. Eight - nine percent felt beefs' cholesterol content was higher or much higher than chicken or fish. The problem was most severe in Ontario where 97 percent of doctors had this opinion and secondly in B.C. where 93 percent held that opinion. As a result of their attitudes towards the fat content and cholesterol content of beef approximately one-third counsel their patients to reduce their beef consumption or substitute chicken and fish in place of some of their meat or eliminate beef all together. As a result we developed "Common Sense Revised" a special mailing for doctors. It tells them today's beef is 35 percent leaner than what the nutrition tables state. It shows them a comparison of cholesterol and fat content in beef compared with chicken and fish.

Dr. Bell showed you an overhead that beef had, I think, six grams of fat and chicken had three grams of fat. Round steak had 179 calories and the chicken had 122. That overhead was incorrect but not through any fault of Dr. Bell's. He was using "The Nutrient Value of Some Common Foods" put out by Health and Welfare Canada as his resource, the same resource that 95 percent of the health care community in Canada use. Those chicken figures are half of what they should be.

We found out about that about three or four years ago. We used that same data in developing some school material. Health and Welfare Canada said, "Your data wasn't correct. The chicken information is wrong. Instead of three grams of fat, it should be six grams of fat. And instead of 122 calories, it should be 171 calories." Unfortunately, this booklet that is out and in great circulation is only updated about every seven years, so everyone's using this incorrect information. The only way you can get the correct information is to call Ottawa and ask for the data from the "Nutrition File," that is updated on a yearly basis.

The problem has been doubly compounded: chicken is less than half what it should be and beef has been overemphasized because Dr. Jones' study proved beef is leaner today. All the beef figures are based on U.S. values and they're much too fat for what is really here in the Canadian market place.

The doctors are very, very pleased with the information, over 600 have sent reply cards, one-third with written comments and they're still coming in. They also find the "lean diet" we developed to be a useful counselling tool. The "lean diet" plan is contained as a fold out in the "Nutrition Guide".

4. Nutrition Guide

A major part of the doctors mailing is the "Nutrition Guide" booklet; developed last spring and circulated by direct mail to 2.4 million households across Canada. A follow-up study found 82 percent of the people that recalled receiving it had read it. Sixty-five percent had kept the booklet. Most importantly, 95 percent of those who had read it believe now that beef could be part of a low calorie diet. Twenty-five said the booklet had positively influenced their thinking and their desire to buy beef. It had changed their attitudes positively towards eating meat because they found that beef was much more healthful and nutritious than they had been led to believe. Copies are available from your BIC office.

5. Lean Diet

The lean diet is quite unique. The National Nutrition Institute and Participaction have featured it in their newsletters and are promoting its use. Based on Canada's Food Guide, it's a very simple way of counting calories. The diet is a series of concentric circles, like a target, with four quarters representing Bread and Cereals, Fruit and Vegetables, Milk and Milk Products and Meat, Fish and Poultry. The dishes in the centre of the target are lowest in calories, those at the outside highest. To get a balanced diet you choose foods from all four quarters. Doctors really love a very simple way to counsel their patients on weight control. Of course, from our perspective, it's great because it shows you can eat beef on a low calorie diet.

Health and Welfare were putting on a promotion last fall in stores in an Info Centre display. Our information and our pamphlet appeared in stores under their banner.

6. Meat Month

February is Canadian Meat Month. This is the second annual Canadian Meat Month. In Toronto this year for a kick-off for Meat Month, we had an outdoor skating party at Nathan Phillips Square in front of City Hall. There was a fellow dressed up as a steer handing out coupons to all the skaters for a free lunch. Sort of combining fitness and meat.

The Ontario Meat Industry contributed $2,500. to Foodshare, the Toronto Food Bank. This is sort of a pet project of the Mayor of Toronto, so that helped to get his involvement in the whole proceedings.

Reaching the urban media in particular is a major goal of Meat Month. The idea is to tell the consumer that meat makes sense, particularly nutritional sense. This is a total red meat promotion sponsored by the Beef Information Centre, the Pork Council, the Sheep Association, Agriculture Canada and the Canadian Meat Council.

In the February issue of Reader's Digest, BIC put in a seven page article "Taking the Myths Out of Meat". We hope this clears up many misconceptions people have.

Another focus on Meat Month is on food service; a flyer was sent out widely across Canada to the food service industry with light lunch ideas for meats because this is an area of the menu that we're losing out on. Light lunches tend to be things like egg dishes, fish dishes, chicken dishes, why not meat?

And lastly, for Meat Month a wide variety of retail points of sale materials, a recipe booklet, rail cards, feature cards, stickers to go on the packages, buttons for the meat personnel to wear and ad mats for the retailers to use in their ads.

7. Jack Spratt

Who better to tell a story about beef being lean than the man who could eat no fat. You'll find magazine ads in Chatelaine, Canadian Living, Homemakers', Maclean's, Time, and Readers' Digest as well as the television commercial.

I feel more optimistic about the beef industry today than I have for at least the last ten years. I feel optimistic because we are starting to see some of the results of the work that we have done. I'm positive that we are starting to turn the corner, but let's not get complacent about that. There's still an awful lot of work that has to be done. If we stop now, we're not going to proceed any further. I'm really encouraged about the cooperation that I'm seeing among all segments of the industry.

We have now formed a Beef Industry Task Force, made up of representatives of the retailing industry, the packing industry and the producing segment. The purpose of this Task Force is to

improve the image of beef in all ways so that we can maintain and improve consumer demand. I think these are very, very positive steps and as I said I'm very optimistic about the future. We've got a lot of work to do, but it's very challenging and I think we are willing to work together.

BOYD ANDERSON

Ladies and gentlemen, before you leave, if I could have your attention for one minute. My name is Boyd Anderson and I'm Chairman of the check-off. You've seen the story here tonight about the Beef Information Centre and their promotions. Carolyn and her group can't do it alone. They have to have money and some of the monies from the check-off are put aside for that promotional work. We heard Bill Farr from the United States today, how they're going to put $50 to $60 million aside for promotion and research.

In Saskatchewan as part of the Canadian effort, we have a check-off, which is voluntary, 50 cents a head and a considerable amount of that money goes towards what you have seen tonight. I would hope that you people leaving here tonight would, if you get an opportunity, just make sure that some of that money continues to come. Perhaps in the near future we can move up to the $1. a head like they are down in the United States and make a promotion together with the rest of the industry in North America.

Thank you.

Table 1: Psychographic study of consumer groups in eight cities across Canada coducted by BIC in 1985.

HEALTH DRIVEN	CAREFREE COOKS	CONVENIENCE ORIENTED	MEAT LOVERS
31%**	25%**	25%**	19%**
Vanc., Three Rivers Saskatoon, Toronto 35%	Montreal 33%	Toronto 34%	Peterborough 28% Vancouver 25%
Mont., Peterborough Edmonton 26%	Peterborough 19%	Vancouver 17%	Toronto 11%
* Extremely conscious of all "Health/Nutrition" aspects of food - Esp. Additives, etc. Fat/Cholesterol Salt Calories	* Opposite to Health Driven - Rarely concern themselves with "Health/ Nutrition" aspects except some concern about fat	* Not as fanatical Re "Health/Nutrition" as health driven but still very conscious of fat/ cholesterol - calories - fat	* Health concerns are almost as strong as the health driven, especially re: additives fat/cholesterol calories salt
* Have generally cut down on use of meat because "it isn't good for you" & doesn't miss it	* Generally likes meat but not committed to it	* Enjoys meat but is concerned about its healthfulness	* They really enjoy meat & would feed deprived without it, but not convinced it's all that good for them
* Convenience & Price - Not factors with them	* Likes cooking and is not concerned about price	* Looks for convenience but concerned about price	* Enjoy cooking & not price sensitive (esp. with meat)

** Average of eight cities

B. I. C. REPORT

INDUSTRY CHALLENGED AT SEMINAR

In addition to health issues, better merchandising is another major problem facing the beef industry.

BIC's objective in this area, is to stimulate retailers and processors to develop and utilize more innovative methods of merchandising beef through new product and marketing techniques.

With this purpose in mind, BIC planned and organized the recent "Strategies for Success" seminar.

Over 150 key industry representatives attended from virtually all the major processing and retailing firms. Throughout the seminar they were presented with many suggestions for marketing opportunities.

Key-note speakers were Drs. John Allen and Tom Pierson from Michigan State University. For the last couple of years they have been involved in an in-depth study of the beef industry for the U.S. Beef Industry Council. Their dynamic presentation challenged the beef industry to meet changing consumer needs.

They then outlined eight challenges and opportunities for the industry.

Strategies for Success

Changing Consumer Needs

1. Health, nutrition and safety
2. Convenience
3. Service
4. Information and understanding
5. New ethnic tastes and variety
6. Consistent quality
7. Value

CHALLENGE	OPPORTUNITY
1. The Image of Beef as Unhealthful	- Tell the positive nutrition story - Better trimmed beef - Incorporate nutritional message into merchandising programs - Target nutritional message to key consumer segments - Educational programs aimed at the healthcare community and schools
2. Need for Improved Fresh Meat Packaging.	Test use of: - mini-subprimals - tray ready, pre-sliced, vacuum packaged meats - chub packs - gas-flush packaging
3. Appropriate fat trim & finish for greater consumer acceptance	- Strive for improved consistency in meat quality - Reduce the visible fat - perhaps to a total trim - Encourage trend towards boneless
4. Consumers Need Information on Beef	- Provide nutrition, cost/serving and cooking instructions at retail - Electronic and print advertising

CHALLENGE	OPPORTUNITY
5. The Beef Industry is Commodity-Oriented... Marketing is Needed	- Move away from commodity-tonnage/price orientation to consumer driven/value orientation - Foster innovation and effective retail merchandising - Identify consumer needs and wants and move in this direction.
6. The High Price Image of Beef	- Value is the key element - not price. - Value = $\frac{\text{Benefits}}{\text{Price}}$ Therefore rather than always lowering price, we should add benefits (in terms of consumer needs) to our product to increase the value perception eg. add convenience, or nutritional value.
	"Featuring" has some negative implications. While it may reduce short-term oversupplies, it can reduce sales volume in the long-term and it increases the variation in product quality. (through product procurement, cutting and trimming).
	Information on packages and consumer advertising enhances consumers value images of beef.
	Product improvement and information can result in a better value image even at a higher price.

7. Meat Products to Match Changing Lifestyles	a commitment to the development and marketing of value added convenience products.
8. Industry Lacks Precise Information on Meat Operations	Encourage the adoption of UPC scanning for retail meat operations. Use scanning information: a) to build merchandising and advertising programs b) to balance inventory c) improve product mix d) test new products
<u>New Product Suggestions:</u> Pre-cut counter ready meats Boneless Beef Pre-cooked beef items Branded Beef Portion control retail meats Better trimmed, extra-lean Microwavable meats	<u>Steinberg's Get Results</u> Last year Steinbergs modified their Sirloin Steak to remove the bone and offered smaller boneless roasts and steaks. RESULT - They doubled their sirloin sales.

Opportunities such as this challenged and motivated this key audience and hopefully we will see some exciting new developments in the future.

EFFECTS OF COW SIZE AND MILK PRODUCTION ON COW EFFICIENCY

Dr. Harlan D. Ritchie
Beef Cattle Specialist
Michigan State University
East Lansing, Michigan

Since 1980, a lot of research data has been generated on the subject of cow efficiency. This paper is an exhaustive review of all that data, because a pet project of mine is staying up to date - so you're going to get the whole load.

Most of the efficiency data deals with breed types and breed crosses because in cow efficiency research we have to look at different biological types. To generate these quickly we cross breeds. If you have breed biases, please don't be offended. I'm not promoting any particular breed, just presenting the data in an unbiased manner.

Another thing to point out, in all the trials reviewed here, the cows were bred to the same bulls within a given trial so sire biases are eliminated and we are looking at differences in biological types of cows.

There are two ways to express efficiency - biological and economic (Tables 1 and 2). Most of the data is biological but what economic data there is I've included because as producers that is what we are really interested in.

Table 1: MEASURES OF BEEF COW BIOLOGICAL EFFICIENCY

1. Lb weaned calf/lb cow weight.
2. Lb weaned calf/cow exposed.
3. Lb weaned calf/cow exposed/lb TDN consumed.
4. Lb edible beef/lb TDN consumed.

Table 2: MEASURES OF ECONOMIC EFFICIENCY

1. Cost of production per lb live weight marketed
2. Cost of production per lb edible portion marketed
3. Net return per cow-calf unit
4. Net return to the cow-calf enterprise

Beef cattle, from a biological point of view are not very efficient. If we look at species and the mega calories of feed energy per kilo of meat protein, beef takes five times as many calories as chicken and three times as many as pork (Table 3.)

Table 3:
BIOLOGICAL EFFICIENCY OF PROTEIN PRODUCTION AMONG VARIOUS SPECIES[a]

Species	Mcal feed energy per kg meat protein
Broiler chicken	80
Turkey	87
Rabbit	105
Pork	151
Lamb	427
Beef	442

[a]Dickerson (1981).

Maintenance accounts for almost 60 percent of the dietary energy expended in a beef enterprise (Table 4). Eight percent to gestation and lactation, 16 percent to replacement heifer, 13 percent to fat in the market progeny and six percent into protein deposition. This six percent compares to 20 percent in non-ruminants.

Table 4:
PERCENT OF DIETARY ENERGY EXPENDED IN VARIOUS BEEF PRODUCTION FUNCTIONS[a]

Function	% of total dietary energy
Maintenance of cow	34
Maintenance of market progeny	23
Maintenance total	57
Gestation & lactation	8
Replacement female	16
Fat on market progeny	13
Protein in market progeny	6
Total	100

[a]Dickerson (1984).

From an energetic viewpoint we are dealing with an inheritantly inefficient animal. We can't make that animal as efficient as the non-ruminant but we can improve it. Also remember that in North America about 90 percent of the calories consumed by beef cattle from conception to consumer is forage or roughage that could not be consumed by humans or by the non-ruminant species. So, even though we're inefficient, we're using a resource that couldn't be used by other species.

Calf Weight/Cow Weight

Chris Dinkle and co-workers at South Dakota State University have looked at several components of efficiency equations (Table 5). They looked at the cow's weight, the cow's yearling weight to height ratio, the calf's weaning weight, the dam's weight at weaning time and then an equation that considered the ratio of the calf weight to the dam's weight. At South Dakota now they have equations that will account for anywhere from 43 to 66 percent of the variation in cow efficiency. Since this, they have developed one that is about 79 percent accurate in predicting cow efficiency. The workers at South Dakota feel that they can develop selection programs for cow efficiency by looking at calf's weight and the cow's weight.

Table 5:

PREDICTION EQUATIONS OF COW EFFICIENCY (WISCONSIN AND SOUTH DAKOTA)[a,b]

Component(s) of equation	Accuracy, %
Dam's yearling weight	22
Dam's yearling weight:height ratio	25
Calf's weaning weight	19
Dam's weight at weaning time	27
Calf's wt + dam's wt	43 to 66

[a]Kirkpatrick et al. (1985).
[b]Lb TDN per lb calf.

Calf Wt. Weaned/Cow Exposed and Calf Wt Weaned/Cow Exposed/TDN

Wisconsin looked at cow size within breed - small, medium, large and very large Hereford cows (Table 6). They weighed from about 1,000 lbs. to 1,400 lbs. The large group of cows were 13 percent more efficient in calf weaned per cow exposed than the small cows but the very large cows were less efficient.

Table 6:

EFFECT OF HEREFORD COW SIZE ON PRODUCTIVITY, WISCONSIN[a]

Cow size	Cow wt., lb	Lb calf weaned per cow exposed (Small = 100)
Small	994	100
Medium	1140	98
Large	1250	113
Very large	1426	95

[a] Olson et al. (1982). Summary of 4 calf crops.

The most exhaustive study in cow efficiency work was done by Agriculture Canada (Table 7). I think at last count there have been nine different refereed journal articles that have come out of that classical piece of work. It's probably the best work that's been done on the continent. Soon, they'll be coming out with their energetic efficiency work. It involves 1,150 cows over 6,000 matings run at two locations - one at Brandon, Manitoba and the other in southern Alberta. The Manitoba conditions were more favourable farm type, better pasture conditions. The Alberta group was run on typical range conditions, more stressful environment than cows run at Brandon.

The cow groups didn't rank quite the same in the two locations. In Manitoba, the Simmental cross half blood cows, were the most efficient - 18 percent more pounds calf weaned per cow exposed at Brandon compared to the Hereford-Angus controls. In Alberta, in more typical range conditions, a more stressful environment, the Charolais and the Simmental cows

switched. The lower milking Charolais cross cows were actually the more efficient group - 15 percent over the controls vs 12 percent for the Simmentals. There was a switch in rank between the Manitoba and the Alberta cows. Their overall average came out the same.

Table 7:

LB CALF WEANED PER COW EXPOSED, 8-YEAR SUMMARY (AGRICULTURE CANADA)

Breed of cow	Location		Avg.
	Manitoba	Alberta	
	(Her X Ang = 100)		
Her X Ang-X	100	100	100
Charolais-X	114	115	115
Simmental-X	118	112	115
Limousin-X	105	101	103

[a]Fredeen et al. (1981); 1150 cows, 6022 matings.

When the breed crosses were compared for longevity in the herd, (Table 8) the half blood Charolais lasted the longest both in Manitoba and Alberta, though the differences weren't large. In all breed groups they stayed in the herd quite well - nearly 90 percent of their potential years.

Table 8:

YEARS IN HERD AS A PERCENTAGE OF POTENTIAL YEARS, 8-YEAR SUMMARY (AGRICULTURE CANADA)[a]

Breed of cow	Location		Avg.
	Manitoba	Alberta	
	% of potential years		
Her X Ang-X	88	84	86.0
Charolais-X	91	88	89.5
Simmental-X	89	84	86.5
Limousin-X	86	81	83.5

[a]Fredeen et al. (1981); 1150 cows; 6022 matings.

Virginia has done a lot of work on lbs. calf weaned/cow exposed too. This is a summation of 4,300 matings with straightbred Angus and Hereford ratioed at 100. All crossbred were 28 percent more efficient but Holstein crosses were almost 40 percent more efficient than the straightbreds (Table 9). Now that's in lush pasture conditions, abundant year round forage.

Table 9:

SUMMARY OF 4,329 BEEF COW MATINGS (1972-78), VIRGINIA[a]

Breed of cow	Lb calf weaned per cow exposed (A & H = 100)
Straightbreds (Angus & Herefords)	100
All crossbreds	128
Holstein crosses	139

[a] Marlowe and Oliver (1979).

At Michigan State we are looking at four breeding groups (Table 10): unselected Herefords, Herefords selected for yearling weight and two rotational cross groups, selecting for yearling growth. Simmental x Charolais x Angus x Hereford make up group three and Simmental x Holstein x Angus x Hereford group four. This is a summation of three calf crops and our top group was group four which was 63 percent better than the unselected Herefords which haven't changed over the 15 years of the trial.

Table 10:

STRAIGHT BREEDING VS. ROTATIONAL CROSSING, MICHIGAN[a]

Breeding group	Lb calf weaned per cow exposed (Uns Her = 100)
Unselected Hereford	100
Selected Hereford	117
Sim X Char X Ang X Her	131
Sim X Hol X Ang X Her	163

[a] Magee (1979, 1981, 1983). Summary of 11th, 12th, 13th calf crops.

However, when we look at lbs. calf weaned per lb. of TDN (Table 11), the groups really come together. The rotational cross groups are big cows and while they produce a lot more, they also eat a lot more. There's not much difference in efficiency - eight or nine percent. Interestingly enough, the selected Herefords were the least efficient, for some reason.

Again we are in a "stress-free" environment with lush pasture conditions and abundant year round feed. I should also mention group four's slaughter weights were getting too high 1,350-1,400 lbs. live and we were being docked for too big carcasses.

Table 11:
EFFICIENCY OF STRAIGHTBREDS VS. CROSSBREDS, MICHIGAN[a]

Breeding group	Lb calf weaned per lb TDN, (Uns Her = 100)
Unselected Hereford	100
Selected Hereford	96
Sim X Char X Ang X Her	109
Sim X Hol X Ang X Her	108

[a] Harpster (1978).

One of the best studies that compared heavy vs. moderate milking cows was in Oklahoma with Hereford, Holstein, and Holstein x Hereford cross (Table 12). The straight Holsteins just couldn't cut it. Their low efficiency figure is a function of lack of fertility, too. And they eat too much feed. The crossbreds do better relative to the straight Hereford but still eat too much. There was no advantage, under these conditions in the higher milking cows.

Table 12:
EFFICIENCY OF HEREFORD, HOLSTEIN AND F_1 COWS, OKLAHOMA[a]

Breed of cow	Lb calf weaned per cow exposed	Lb calf weaned per cow exposed per lb TDN
	Ratio (Her = 100)	
Hereford	100	100
Her X Hol	105	94
Holstein	103	77

[a] Kropp et al. (1973); Holloway et al. (1975a,b); Wyatt et al. (1977).

Some Wisconsin work was also done with dairy crosses since Wisconsin is a major dairy state and Holsteins are a major resource. Again Holsteins don't make it on a lb. calf weaned per cow exposed per lb. TDN basis (Table 13).

They generated four groups of F1 crosses: Hereford x Holstein, Simmental x Holstein, Angus x Holstein and even Chianina x Holstein in another test (Table 14). They had some big mother cows! But their total numbers were small so from a statisticians standpoint there was no significant differences. The trend was for the Hereford x Holstein to be the most efficient. As you'd expect - there was more output in these bigger cows but because they ate more feed, it diluted the effect.

Table 13: LIFE CYCLE EFFICIENCY OF FOUR BREED TYPES OF COWS, WISCONSIN[a]

Breed of cow	Lb calf weaned[b] per cow exposed per lb TDN (Her X Beef = 100)
Hereford X Beef cross	100
Straight Hereford	94
Hereford X Dairy cross	90
Straight Holstein	82

[a] Davis et al. (1983).
[b] Includes salvage wt. of dam on a wean. wt. equiv. basis.

Table 14: LIFE CYCLE EFFICIENCY OF FOUR F_1 HOLSTEIN GROUPS OF COWS, WISCONSIN[a]

Breed of cow	Lb calf weaned[b] per cow exposed per lb TDN (Her X Hol = 100)
Hereford X Holstein	100
Simmental X Holstein	95
Angus X Holstein	94
Chianina X Holstein	91

[a] Davis et al. (1983).
[b] Includes salvage wt. of dam on a wean. wt. equiv. basis.

Down in Florida they looked at Angus, Angus x Brown Swiss, and straight Brown Swiss for beef production. If we just look at weaning weight (Table 15) those heavy milking groups Brown Swiss and Swiss crosses - they look good, 23 percent and 17 percent higher than the Angus. But the Brown Swiss had a fertility wreck - only 60 percent weaning rate. The crossbreds were more fertile, with 22 percent more calf weaned per cow exposed.

Table 15:

PRODUCTIVITY OF ANGUS, BROWN SWISS AND F_1 CROSS COWS, 3-YEAR SUMMARY (FLORIDA)[a]

Breed of cow	Wean. rate, %	Wean. wt.	Lb calf weaned per cow exposed
		(Angus = 100)	
	***	***	***
Angus	85.9	100	100
Angus X Brown Swiss	90.0	117	122
Brown Swiss	60.0	123	86

[a]Olson et al. (1985).
***p<.001.

But if we divide output by feed inputs the most efficient group were the Angus (Table 16). The crossbreds were only 89 percent as efficient and the straight Swiss 61 percent as efficient in lbs. calf weaned per cow exposed per lb. TDN.

Table 16:

EFFICIENCY OF ANGUS, BROWN SWISS AND F_1 CROSS COWS, 2-YEAR SUMMARY (FLORIDA)[a]

Breed of cow	Lb calf weaned per cow exposed per lb TDN (Angus = 100)
Angus	100[b]
Angus X Brown Swiss	89[b]
Brown Swiss	61[c]

[a]Filho et al. (1983).
[bc]p<.05.

In a recent Purdue study (Table 17), Angus x Hereford, Charolais x Hereford and Brown Swiss x Hereford were all higher in efficiency than straight Hereford. Of course the Hereford did not have the hybrid vigor benefit so it is not quite fair but they were the controls in this experiment. When output (lbs.) is divided by input (TDN) there is very little difference in efficiency between the three crossbred groups - no significant differences even though on the output side Brown Swiss certainly looked best. Feed conditions there are abundant.

Table 17: EFFICIENCY OF COWS VARYING IN BIOLOGICAL TYPE, PURDUE[a]

Breed of cow	Lb calf weaned per cow exposed	Lb calf weaned per cow exposed per lb TDN
	Ratio (A X H = 100)	
Straight Hereford	78	87
Angus X Hereford	100	100
Charolais X Hereford	105	103
Brown Swiss X Hereford	125	100

[a] Based on data from Lemenager et al. (1980) and Nelson et al. (1982).

An Oklahoma study (Table 18) compared Angus x Hereford, Simmental cross, Swiss cross and Jersey cross. The Jersey is a biological type - small heavy milking. If we just look at lbs. calf per lb. TDN there is little difference between the groups. However, when we divide total output (lbs. calf per cow exposed) by input (TDN) the Simmental and Brown Swiss crosses tended to be less efficient because of lower fertility. The numbers were small so there were no statistical significant differences even though the small heavy milking Jersey cross were 10 percent more efficient than the black baldies.

Table 18: EFFICIENCY OF F_1 COWS (OKLAHOMA)[a]

Breed of cow	Wean rate, %	Lb calf per lb TDN[b]	Lb calf weaned per cow exposed per lb TDN[c]
		Ratio (A X H = 100)	
Ang X Her-X	74.6	100	100
Simmental-X	70.2	100	94
Brown Swiss-X	72.4	102	99
Jersey-X	81.2	101	110

[a]Marshall et al. (1984); Frahm and Marshall (1985).
[b]Based on 105 cow-calf pairs fed in drylot for 1 year.
[c]Adjusted for differences in weaning rate.

The U.S. Meat Animal Research Centre at Clay Centre, Nebraska has done some very good work in beef cow efficiency in recent years. In 1983 they published a rather explosive study (Table 19) of Angus x Hereford, Charolais cross, Jersey cross and Simmental cross. No significant differences in fertility (weaning rate) and the Simmental crosses were nine percent more efficient in lbs. calf

weaned per cow exposed than the Angus x Hereford. However, they ate 28 percent more and as a result were 15 percent less efficient than the Angus x Hereford because of higher maintenance requirements. The environment there would be excellent.

Table 19:

WEANING EFFICIENCY OF DIFFERENT BIOLOGICAL TYPES OF COWS, U.S. MARC[a]

Breed of cow	Wean. rate, %	Lb calf weaned per cow exposed	Annual cow TDN	Lb calf weaned per cow exposed per lb TDN
		Ratio (A x H = 100)		
Ang x Her	88.2	100	100	100
Charolais-X	84.8	102	109	94
Jersey-X	86.4	100	106	94
Simmental-X	88.0	109	128	85

[a]Jenkins and Ferrell (1983).

These same four groups of cows went from Nebraska to Alberta, where Agriculture Canada worked with them. On the first calf 2-yr-olds from these biological types, Bowden got the exact opposite response (Table 20). Fertility was better on the Char cross and Simmental cross. There was no difference in lb. calf weaned per lb. TDN but when fertility was factored in, the Charolais cross was 23 percent ahead of the Hereford x Angus and the Simmental cross 29 percent ahead.

Table 20:

EFFICIENCY OF 1ST-CALF 2-YR-OLD F1 COWS, CANADA[a]

Breed of cow	Weaning rate, %	Lb calf weaned per lb TDN[b]	Lb calf weaned per cow exposed per lb TDN[b]
		Ratio (H X A = 100)	
Her X Ang	69.7	100	100
Jer X Ang	70.0	98	103
Char X Ang	87.1	102	123
Sim X Ang	90.3	100	129

[a] Bowden (1980).
[b] TDN consumption from 129 days pregestation through 1st lactation, including calf creep.

Sample sizes, (number of cows per group) was probably about 40 with 160 cows total. That is not small when you are monitoring TDN intake; that is good size.

Again, Clay Centre work, with a different set of cows, still using Hereford x Angus as controls, looked at Red Poll cross, Brown Swiss cross, Gelbvieh cross, Maine Anjou cross and Chianina cross cows (Table 21). They looked at calf gain, cow and calf energy intake and lb. calf gain per lb. TDN. The differences are not terribly large but do tend to favour the smaller biological types because the big ones ate proportionately more than their output. This study was NOT year round but from day 45 to 184 of the lactation (post partum) period.

Table 21:

OUTPUT/INPUT DIFFERENCES AMONG COWS OF DIVERSE BIOLOGICAL TYPE UP TO WEANING TIME, U.S. MARC[a,b]

Breed of cow	Calf gain	Cow + calf TDN	Lb calf gain per lb TDN
		Ratio (A x H = 100)	
Ang x Her	100	100	100[c]
Red Poll-X	104	104	100[c]
Brown Swiss-X	106	111	96[cd]
Gelbvieh-X	104	110	94[d]
Maine Anjou-X	106	107	99[c]
Chianina-X	102	110	93[d]

[a]Cundiff et al. (1983).
[b]139-day lactation period (45 to 184 days post-partum).
[cd]Indicates significant differences (P<.05).

At Miles City, Montana (Table 22) they looked at six groups of cows: straight Angus, Hereford, Charolais and the crosses of Angus x Hereford, Angus x Charolais and Hereford x Charolais.

Table 22:

BIOLOGICAL EFFICIENCY OF THE COW-CALF UNIT AT WEANING TIME, MILES CITY, MONTANA[a]

Breed of cow	Lb calf weaned per lb TDN (A x H = 100)[b]
Angus	99
Hereford	90
Charolais	98
Angus x Hereford	100
Angus x Charolais	97
Hereford x Charolais	97

[a]Wagner et al. (1984); 137 cow-calf pairs.
[b]No adjustment for differences in reproduction.

The measure of efficiency was pounds of calf weaned per pound of TDN, not adjusted for differences in reproduc-

tion. Essentially no significant differences here except the straight Herefords tended to be a little less efficient than the other groups. In the other groups, the differences were not significant.

In some more work at Miles City (Table 23) they looked at Hereford crosses of Angus (controls) Red Poll, Tarentaise, Pinzgauer, and Simmental. The weaning rate is a little lower on the larger heavier milking types, but they are higher in weaning weight. In lbs. calf per cow exposed the larger heavier milking types are running a little lower, especially the Pinzgauer cross, though not statistically significant.

Table 23:

PRODUCTIVITY OF F_1 COWS, MILES CITY, MONTANA[a]

Breed of cow	Wean. rate, %	Wean. wt.	Lb calf weaned per cow exposed	% of cows remaining after 5 calves
		Ratio (A x H = 100)		
Ang x Her	85.3	100	100	64
RP x Her	85.2	102	101	55
Tar x Her	80.1	108	98	61
Pinz x Her	75.3	103	91	41
Sim x Her	75.3	106	94	38

[a]Reynolds (1983); summary of first 5 calf crops.

Another Montana study, (Table 24), done at the Havre station in northern Montana, almost on the Canadian line looked at straight Herefords, Angus-Hereford cross cows, and then different levels of Simmental breeding. Quarter bloods, half bloods, and three-quarters. The first time these cows produced, as two-year-olds, the weaning rate was 55 percent, 86 percent, 65 percent, 73 percent, 69 percent. The straight Herefords didn't do as well because they were late coming into puberty and enough of them didn't come into puberty to catch the breeding season. Pounds per calf weaned per cow exposed favoured the Angus Hereford crosses over the other groups

Table 24:

PRODUCTIVITY OF 2-YR-OLD COWS OF VARYING BIOLOGICAL TYPES (MONTANA)[a]

Breed of cow	Wean. rate, %	Lb calf weaned per cow exposed (A X H = 100)
Hereford	55	58
1/2 Ang, 1/2 Her	86	100
1/4 Sim, 3/4 Her	65	75
1/2 Sim, 1/2 Her	73	91
3/4 Sim, 1/4 Her	69	86

[a]Kress et al. (1984).

Again at Havre, one year's data comparing 3/4 Simmentals against straight Herefords (Table 25) favours the Simmentals till we look at energy consumption. They were 9 % heavier, gave 36 percent more milk and weaned an eight percent heavier calf. Over the 205 day lactation period, they also ate 24 percent more TDN and as a result are 14 percent less efficient when we look at weaning weight divide by forage intake.

Table 25:

EFFICIENCY OF HEREFORD AND 3/4 SIMMENTAL COWS[a]

Item	Cow breed: Straight Hereford	Cow breed: 3/4 Sim 1/4 Her	3/4 Sim Minus Her, %
No. cows	26	16	-
Cow wt., lb	1116	1212	+9%
Milk prod., 24 hr, lb	16.5	22.5	+36%
Weaning wt., lb	477	514	+8%
205-day TDN, lb	1754	2183	+24%
Wean wt./TDN, lb	.272	.235	-14%

[a]Taken from Doornbos et al., 1983 (Montana); one year's data.

In Western South Dakota under a good environment, with plentiful feed conditions the Simmental cross cows out performed the black baldies over five yrs. (Table 26). No difference in weaning rate, 10 percent more weaning weight and lb calf per cow exposed and no difference in percent of cows remaining in the herd after five years. But keep in mind, feed conditions were plentiful.

Table 26:

F_1 COWS ON WESTERN SOUTH DAKOTA RANGE, 5-YEAR SUMMARY[a]

Breed of cow	Wean. rate, %	Wean. wt.	Lb calf weaned per cow exposed	% cows after 5 yr.
		Ratio (H X A = 100)		
Her X Ang	85.0	100	100	63.3
Sim X Ang	85.0	110**	110**	66.7

[a]Miller and Deutscher (1985).
**p<.01.

In another South Dakota study, (Table 27) comparing Angus, Charolais x Angus and Charolais, the straight Charolais were not as fertile. There was no difference in lb. calf weaned per lb. TDN until fertility was factored in. There was no difference between the Angus or Charolais x Angus cross but the straight Charolais were much less efficient. Feed conditions here would be good.

Table 27:

EFFICIENCY UP TO WEANING TIME (SOUTH DAKOTA)

Breed of cow	Wean. rate,[a] %	Lb calf per lb TDN[b]	Lb calf weaned per cow exposed per lb TDN
		Ratio (Angus = 100)	
Angus	83.0	100	100
Char X Ang	81.0	99	96
Charolais	64.2	98	76

[a]From Marshall et al. (1976).
[b]From Brown and Dinkel (1982).

Then they split the data into little cows (less than 963 lbs.) and big cows (over 963 lbs.) regardless of breed make up (Table 28). Without adjusting for differences in reproductive rate there was no difference between the small and big cows in lb. calf weaned per lb. TDN.

Table 28:

DIFFERENCES IN EFFICIENCY BETWEEN COW SIZES (SOUTH DAKOTA)[a]

Size of cow	Lb calf per lb TDN[b,c]
	(Small = 100)
Small cows (below 963 lb)	100
Large cows (above 963 lb)	101

[a]Dinkel (1984); involved Charolais, Angus & crosses.
[b]Not adjusted for differences in reproductive rate.
[c]Differences not statistically significant.

In Phase II of this experiment in South Dakota, they are comparing straight Herefords, Angus x Hereford and Simmental x Hereford under drylot or range conditions (Table 29). There was no significant difference in weaning rate between the three breed groups whether in drylot or on range. And no significant difference in lbs. calf weaned per cow exposed per lb. TDN. They could not pick up a difference between these three biological types, whether in drylot or on range.

Table 29:

BREED GROUP DIFFERENCES IN COW EFFICIENCY, SOUTH DAKOTA[a]

Breed of cow	Drylot: Wean. rate, %	Drylot: Lb calf weaned per cow exposed per lb TDN (A x H = 100)	Range: Wean. rate, %	Range: Lb calf weaned per cow exposed per lb TDN (A x H = 100)
Hereford	70	98	81	95
Ang x Her	69	100	87	100
Sim x Her	69	99	83	101

[a]Dinkel (1983).

Until now. This data was unpublished as I prepared this paper and the information I wrestled from Chris Dinkle himself. Dinkle is probably the leading researcher in beef cow efficiency. They've added a fourth group here Tarentaise x Hereford cross (Table 30), and have finally after many years picked up some significant differences. The last group, Tarentaise x Hereford is 12 percent more efficient in lb. calf weaned per lb. TDN (not adjusted for differences in weaning rate) than the Angus x Hereford cows. Range conditions are excellent at their Antelope Range Research Station.

Table 30:

DIFFERENCES IN COW EFFICIENCY BY BREED GROUPS (ANTELOPE RANGE STATION, SOUTH DAKOTA)[a]

Breed of cow	Lb calf per lb TDN[b]
	(A X H = 100)
Hereford	102[c,d]
Angus X Hereford	100[d]
Simmental X Hereford	104[c]
Tarentaise X Hereford	112[e]

[a]Dinkel (1985).
[b]Not adjusted for differences in weaning rate.
[cde]Means with different superscripts differ (P<.05).

Table 31 shows some breed type X environmental interactions in New Zealand research. One environment has excellent feed conditions, the other only fair and there are some switches in breed group efficiencies measured as lbs. calf weaned per cow exposed. The

larger, heavier milking types tend to drop as we move from excellent to fair conditions: Simmental cross from 121 percent of the Hereford x Angus control to 87 percent. (I can't figure out why the Holstein crosses didn't drop.)

Table 31:

PRODUCTIVITY OF F_1 COWS UNDER TWO ENVIRONMENTS (NEW ZEALAND)[a]

Breed of cow	Environment		
	Excellent	Fair	Avg.
	Ratio (AH + HA = 100)		
Holstein-X	129	125	127
Jersey-X	113	110	111
South Devon-X	108	101	105
Simmental-X	121	87	104
Maine Anjou-X	109	99	104
AH + HA	100	100	100
Brahman-X	108	81	95
Charolais-X	98	88	93
Chianina-X	98	88	93
Limousin-X	105	78	92
Straight Angus	96	80	88

[a]Baker and Carter, 1980 (Proc. World Cong. on Sheep & Beef).

I summarized all this work, and it may not be statistically sound but I did it anyhow in the dark of the night (Table 32). Output, adjusted for differences in reproductive rate is lbs. calf weaned per cow exposed; output divided by input is lbs. calf weaned per cow exposed per lb. TDN. If we just look at output, the larger heavier milking groups look better; when we factor in the feed input they all come together. (The Jerseys look a little better but were only included in three trials.) The bottom line, if we average all the trials is no significant difference in output divided by input.

Table 32:

SUMMARY OF COW EFFICIENCY TRIALS (1976-85)[a]

Breed of cow	Lb calf weaned per cow exposed	Lb calf weaned per cow exposed per lb TDN
	Ratio (A X H = 100)	
Ang X Her	100	100
Charolais-X	103	100
Jersey-X	114	106
Simmental-X	108	101
BS or Hol-X	117	95

[a]Averages from 14 trials.

Retail Production/TDN

Lets look at efficiency as retail product per unit of feed energy - lbs. edible portion per lb. TDN. An Ohio study found no difference between Hereford, Angus x Hereford, Charolais x Hereford and Charolais cows (Table 33) in lbs. edible beef divided by the total energy consumed by cow and calf up to slaughter time.

TABLE 33: TOTAL EFFICIENCY OF BEEF PRODUCTION, OHIO[a]

Breed of cow	Lb edible portion per lb TDN (Her = 100)
Hereford	98
Angus X Hereford	100
Charolais X Hereford	98
Charolais	99

[a] Klosterman and Parker (1976); involved 133 cow-calf pairs.

The same measure at Oklahoma, with their Herefords and Hereford x Holsteins showed no differences (Table 34). The Holsteins were significantly less efficient in lbs. of edible beef production because their fertility was lower and feed intake higher.

TABLE 34: TOTAL EFFICIENCY OF BEEF PRODUCTION, OKLAHOMA[a]

Breed of cow	Lb edible portion per lb TDN (Her = 100)
Hereford	100
Hereford X Holstein	97
Holstein	88

[a] Summary of 1st and 2nd calf crops from 2- and 3-year-old cows (Holloway et al., 1975b).

Wisconsin showed the same thing (Table 35), the straight Holsteins were considerably less efficient in lbs. trimmed wholesale cuts per lb. TDN.

TABLE 35:
TOTAL EFFICIENCY OF BEEF PRODUCTION (WISCONSIN)[a]

Breed of cow	Lb trimmed wholesale cuts[b,c] per lb TDN (Her X Beef = 100)
Hereford X Beef cross	100
Straight Hereford	94
Hereford X Dairy cross	93
Straight Holstein	87

[a]Davis et al. (1984).
[b]Includes wholesale cuts from progeny and dam.
[c]$P<.03$.

The study with four groups of Holstein crosses (Table 36) showed no differences between the four groups.

TABLE 36:
TOTAL EFFICIENCY OF BEEF PRODUCTION (WISCONSIN)[a]

Breed of cow	Lb trimmed wholesale cuts[b] per lb TDN (Her X Hol = 100)
Hereford X Holstein	100
Simmental X Holstein	99
Angus X Holstein	97
Chianina X Holstein	97

[a]Davis et al. (1984).
[b]Includes wholesale cuts from progeny and dam.

Washington did a similar study (Table 37). The Jersey cross looked a little better but not significant.

TABLE 37:
TOTAL EFFICIENCY OF BEEF PRODUCTION, WASHINGTON[a]

Breed of cow	Lb edible portion per lb TDN (H X A = 100)
Hereford X Angus	100
Jersey X Angus	106
Simmental X Angus	103

[a] Based on data from Martin and McReynolds (1979); involved 57 cow-calf pairs.

South Dakota found no significant differences (Table 38.)

TABLE 38:
TOTAL EFFICIENCY OF BEEF PRODUCTION, SOUTH DAKOTA[a]

Breed of cow	Lb edible portion per lb TDN (Angus = 100)
Angus	100
Charolais X Angus	100
Charolais	102

[a] Brown and Dinkel (1982); involved 227 cow-calf pairs.

The bottom line is, if we go all the way through to slaughter there is no significant difference, except Holsteins, in the above five studies.

This Miles City, Montana study did not correct for differences in reproduction (Table 39) while the other studies did. The differences here in lb. lean cuts per lb. TDN were not significant.

TABLE 39:
BIOLOGICAL EFFICIENCY OF THE COW-CALF UNIT AT SLAUGHTER TIME, MILES CITY, MONTANA[a]

Breed of cow	Lb lean cuts per lb TDN (A x H = 100)[b]
Angus	93
Hereford	94
Charolais	104
Angus x Hereford	100
Angus x Charolais	95
Hereford x Charolais	98

[a]Wagner et al. (1984); 137 cow-calf pairs.
[b]No adjustment for differences in reproduction.

Also at Miles City they correlated several calf traits and cow traits with overall lifetime efficiency (Table 40). There were absolutely no correlations between any cow measure and efficiency. The taller cows weren't more efficient. The shorter cows weren't more efficient. There was no cow trait in this study that you could measure and predict cow efficiency.

TABLE 40:
CORRELATIONS BETWEEN EFFICIENCY OF THE COW-CALF UNIT AT SLAUGHTER AND VARIOUS TRAITS[a]

Trait	Correlation
Calf traits	
180-day adjusted wt.	.40
ADG, post-weaning	.47
ADG, birth to slaughter	.62
Wt. of lean cuts	.72
Wt. of lean cuts/day of age	.81
Percent cutability	.37
Calf age at slaughter	-.15
Cow traits	
Hip height	-.06
Cannon bone length	-.12
Cow wt. at calving	-.13
Cow wt. at weaning	-.13

[a] Taken from Wagner (1978). Efficiency was defined as wt. of lean cuts divided by total TDN intake of cow for a year and calf up to slaughter.

At Clay Centre, MARC did find that the heavier milking groups, the Jersey and Simmental crosses, were significantly less efficient that the Angus x Herefords and the Charolais cross groups (Table 41).

TABLE 41:
TOTAL EFFICIENCY OF BEEF PRODUCTION, U.S. MARC[a]

Breed of cow	Lb retail product per cow exposed per lb total TDN (A x H = 100)
Angus x Hereford	100
Charolais-X	100
Jersey-X	92
Simmental-X	92

[a]Jenkins and Ferrell (1983).

Dickerson in Nebraska took the Clay Centre work and calculated total cost of production from a feed energy viewpoint for various biological types (Table 42). He calculated total cost in feed energy per unit of retail product marketed. So in this case, the **higher** the **number** the **lower** the **efficiency.** The two most efficient groups were Maine Anjou and Chianina. The least efficient were the Jerseys, when you put dollars and cents to it.

TABLE 42:
BIOLOGICAL EFFICIENCY OF LEAN BEEF PRODUCTION FOR BREED SAMPLES USED IN ROTATIONAL CROSSING UNDER UNLIMITED NUTRIENT AVAILABILITY[a,b]

Breed	Feed Mcal/kg retail product marketed: Cow cost	Feedlot cost	Total cost
	Ang X Her = 100[b]		
Ang X Her	100	100	100
Jersey	142	115	124
Red Poll	122	116	115
Simmental	126	87	110
Maine Anjou	108	82	96
Charolais	117	76	103
Limousin	115	75	101
Chianina	111	77	95

[a]Taken from Dickerson (1984) and Gosey (1984).
[b]Lower figure denotes better efficiency.

Kansas State looked at Polled Hereford and Simmental straightbreds under conventional and accelerated management systems (Table 43). Conventional meant the calves were weaned, backgrounded on pasture and feedlot finished. In the accelerated group, the calves were weaned directly into a feedlot and finished for slaughter at about 14 months of age. As you would expect, the Polled Herefords performed better under coventional management; the Simmentals under accelerated.

TABLE 43:
EFFICIENCY, BIRTH TO SLAUGHTER (KANSAS)[a]

Management system and breed	Lb retail cuts per lb TDN
	(Conv., PH = 100)
Conventional Management	
Polled Hereford	100
Simmental	98
Accelerated Management	
Polled Hereford	97
Simmental	104

[a]Schalles et al. (1983).

If we summarize the nine trials which used Angus x Hereford as ratio 100 (Table 44), even though it may not be **statistically** sound, there was no **big** differences. But the numbers of animals studied weren't as large as for efficiency to weaning. The Jerseys were the only group that tended to be less efficient.

TABLE 44: SUMMARY OF COW EFFICIENCY TRIALS, 1975-84 (RETAIL PRODUCT/TDN)

Research station	A X H cross	Char cross	Jer cross	Sim cross	Hol cross
	Ratio (A X H = 100)				
Okla. (1975)	100[a]	--	--	--	97
Ohio (1976)	100	98	--	--	--
Wash. (1979)	100	--	106	103	--
S.D. (1982)	100[a]	100	--	--	--
MARC (1984)	100	100	92	92	--
Miles City (1984)	100	97	--	--	--
Wis. (1984)	100	--	--	--	93
Dickerson (1984)	100	97	81	91	--
Kansas (1983)	100[a]	--	--	102	--
AVERAGE	100	98.4	93.0	97.0	95.0

[a]Straight British cows.

Economic Efficiency

Biologically, as a species, beef looks a little better. We are about three times less efficient than poultry in cost of production in dollars per kilogram of meat protein (Table 45).

TABLE 45:
ECONOMIC EFFICIENCY OF PROTEIN PRODUCTION AMONG VARIOUS SPECIES[a]

Species	Cost of production, $/kg meat protein
Broiler chicken	5.25
Turkey	5.90
Rabbit	7.40
Pork	11.10
Lamb	15.00
Beef	15.75

[a]Dickerson (1981).

If you look back at Table 3 we were five times less efficient than poultry in energy conversion. The improvement in efficiency from a dollar standpoint is because beef uses resources that non-ruminants (poultry) can't.

Oklahoma looked at their Hereford, Holstein cross and straight Holstein groups and calculated the necessary selling price at weaning time based on cow size and milk production (Table 46). Even though the calves of the larger heavier milking cows weighed more, they had to sell for more per pound.

TABLE 46:
NECESSARY SELLING PRICE FOR CALVES PRODUCED BY COWS VARYING IN SIZE AND/OR MILK PRODUCTION[a]

Cow wt., lb	Daily milk, lb	Annual cost per cow $	Calf wt. per cow, lb	Necessary selling price, $/cwt
1000	10	272	423	$64
1000	20	336	468	$72
1400	10	342	477	$72
1400	20	402	522	$77

[a] Based on Oklahoma data (Totusek, 1981, 1982).

The net return in commercial cow herds can be calculated for a given land base as follows: **Carrying capacity x reproductive rate x livability x weaning weight x calf price plus cull cow salvage minus total costs.** South Dakota did just that with their three breed groups Herefords, black baldies and Simmental x Herefords (Table 47). Back in 1983, they were **all** negative but two groups were less negative than the straight Herefords. Not much difference between the Hereford x Angus and Simmental x Herefords but it certainly says something for **crossbreeding**, doesn't it?

TABLE 47:
ESTIMATED NET RETURN OF COW BREED GROUPS, SOUTH DAKOTA[a]

Breed of cow	Carrying capacity, no.	Gross calf wt., lb	Price per lb, $	Gross return, $	Annual costs, $	Net return, $
Hereford	99	36,005	.60	21,603	42,275	-20,672
Ang x Her	100	40,020	.64	25,613	42,600	-16,987
Sim x Her	95	40,608	.66	25,801	41,375	-14,574

[a]Monfore et al. (1983); Antelope Range Livestock Station.

Kansas did the same thing, looking at net returns per 1,000 acres. Again the crossbreds out performed the straight breeds (Table 48).

TABLE 48:
ECONOMIC ANALYSIS OF THREE BREED-TYPES OF COWS ON 1000 A. OF GREAT PLAINS LAND, KANSAS[a]

Item	Breed of cow: Straight-bred British	Angus x Hereford	Big breed x Brit. breed
Cows/1000 A.	100	97	94
Calf wean. wt., lb	460	500	549
Weaning rate, %	88	94	92
Gross returns/1000 A., $	26,248	29,449	30,033
Gross cost/cow, $	365	387	407
Gross costs/1000 A., $	36,500	37,539	38,258
Net returns/1000 A., $	-10,252	-8,090	-8,225

[a]Coran and Sims (1983); estimates based on recent research.

Oklahoma (Table 49) looked at gross margins per cow from selling calves at weaning or slaughter (either as carcass weight or retail cut basis). The Simmental was least efficient. The wide differences if sold at weaning, kind of came together if they were sold on a carcass weight basis but spread out again on a retail cut basis. The Swiss and Jerseys came out a little bit ahead. The point is that the differences in breed groups at weaning were less if the calves were fed out.

TABLE 49:
GROSS MARGINS ($/COW) FROM SELLING CALVES AT WEANING OR SLAUGHTER FROM F_1 COWS (OKLAHOMA)[a]

Breed of cow	Marketing end-point: Weaned calves	Carcass wt.	Retail cuts
	Ratio (A X H = 100)		
Ang X Her-X	100	100	100
Simmental-X	93	93	96
Brown Swiss-X	122	102	105
Jersey-X	132	100	106

[a]Marshall and Frahm (1985).

Clay Centre data, (Table 50), total cost per lb. retail product favoured the Jersey cross and Simmental cross cows by eight percent.

TABLE 50:
IMPACT OF BIOLOGICAL TYPE ON ECONOMIC EFFICIENCY OF LEAN BEEF PRODUCTION[a]

Breed	Cow cost $	Feed-lot cost $	Total cost $	Retail prod. lb	Total cost/lb R.P. $
Ang x Her	342	294	636	420	1.51(100)
Char-x	371	284	655	438	1.50(100)
Jer-x	363	277	640	392	1.63(108)
Sim-x	438	293	731	449	1.63(108)

[a]Adapted from Jenkins and Ferrell (1983).

Dickerson ratioed dollars cost per kilogram of retail product marketed against the black baldies, using Clay Centre data (Table 51). The Jerseys were the most costly, the Maine Anjou and Chianina groups the least costly.

TABLE 51:
ECONOMIC EFFICIENCY OF LEAN BEEF PRODUCTION FOR BREED SAMPLES USED IN ROTATIONAL CROSSING UNDER UNLIMITED NUTRIENT AVAILABILITY[a]

Breed	Cost/kg retail product marketed, $		
	Cow cost	Feedlot cost	Total cost
	Ang x Her = 100		
Ang x Her	100	100	100
Jersey	141	107	120
Red Poll	122	109	111
Simmental	126	92	110
Maine-Anjou	108	91	97
Charolais	117	82	103
Limousin	115	78	100
Chianina	111	86	96

[a]Taken from Dickerson (1984) and Gosey (1984).

Kansas fed out two distinctly different biological types of steers Angus x Hereford and Simmental x Chianina under their conventional and accelerated programs (Table 52) with profit per head as the bottom line. This excludes the cow, includes the feedlot phase (post weaning to slaughter) only. Both groups lost money under conventional management but the British cross lost least. Under accelerated management the Simmental x Chianina cross made a profit. Accelerated program favours the big crosses; conventional favours the smaller types.

TABLE 52:
TWO POST-WEANING PRODUCTION SYSTEMS AND TWO CATTLE TYPES (KANSAS)[a]

Item	Cattle type X production system			
	Accelerated		Conventional	
	A X H	S X C	A X H	S X C
Mcal ME/lb gain	8.9^{c}	8.1^{d}	10.6^{b}	11.0^{b}
Quality grade	G^{+bc}	G^{-d}	Ch^{-b}	G^{+bc}
Tenderness, kg shear	2.74^{cd}	2.63^{d}	3.00^{bc}	3.22^{b}
Cost/lb retail prod., $	1.53	1.35	1.65	1.54
Profit/head, $	-29	+10	-59	-62

[a]Dikeman et al. (1985).
bcdp<.05.

Why Cows Differ In Efficiency

Some basic research work, done very recently has found one reason why cows differ in their efficiency **Maintenance requirements** differ with biological type. Biological types with genetic potential for high milk or growth production appear to have higher maintenance energy requirements. Secondly, as a consequence of having higher maintenance requirements, animals having a genetic potential for high productivity may be at a disadvantage in a restricted environment (Table 53).

TABLE 53:
MAINTENANCE REQUIREMENTS VARY WITH BIOLOGICAL TYPE[a]

1. Biological types with genetic potential for high production (milk, growth, etc.) appear to have higher maintenance energy requirements.
2. As a consequence of their increased maintenance requirements, animals having genetic potential for high productivity may be at a disadvantage in a restrictive environment.

[a]Ferrell and Jenkins (1985).

Why is there an increase in maintenance requirements for these high producing animals? One answer may be the increased weight of visceral organs (Table 54). They have a high rate of energy expenditure in the form of active transport of sodium and potassium across cell membranes. That is energetically expensive. Protein metabolism is energetically expensive.

TABLE 54:
POSSIBILE EXPLANATIONS FOR INCREASED MAINTENANCE REQUIREMENTS IN HIGH PRODUCING ANIMALS

1. Increased weight of visceral organs (liver, lung, heart, kidney, intestines, etc.).
2. Metabolism of the visceral organs (esp. liver & GI tract) has a high rate of energy expenditure:
   a. Active transport of sodium & potassium is expensive.
   b. Protein metabolism is expensive.
3. Greater lean tissue (protein) mass.
4. Higher rate of total body protein synthesis.

These are some of the fundamental reasons why our higher producing animals, particularly the higher milking animals have a higher maintenance requirement. This work will go on and the results will be interesting to follow.

Summary

Lets try to make sense out of this mish-mash of studies and data. **Large differences in reproduction have a profound impact on cow efficiency** and tend to override all factors, such as calf weight, edible portion, and so on in expressions of efficiency.

Under liberal feed supply and relatively stress free environment, pounds per calf weaned per cow exposed tends to increase as cow size and milk levels increase. There are no consistent differences between biological types and pounds of calf weaned per pound of TDN consumed. However, there may be a tendency for large, extremely heavy milking types to be slightly less efficient in TDN utilization. There are no consistent differences between biological types and pounds of edible beef produced per pound of total TDN consumed.

Under limited feed supply and/or a stressful environment, biological types having low to moderate size and/or low to moderate milk tend to be better adapted and exceed the larger, heavier milking types in most measures of efficiency.

Our Beef-Cow Efficiency Forum which was held at Fort Collins, Colorado and East Lansing, Michigan summarized the information this way:

1) Biological efficiency (beef produced per unit of feed energy) and economic efficiency (net return) are not necessarily the same.

2) Measures of mature cow size (weight, height, etc.) are not correlated with biological efficiency.

3) Frame size is primarily an indicator of: (1) Birth weight; (2) Weight at a given carcass composition; (3) Mature weight.

4) Selection for growth should occur within a frame size.

5) Within a frame size, faster gaining cattle are more efficient.

6) Calf survivability and rapid early growth of the calf are the key factors in biological efficiency.

7) Rapid early growth (yearling weight) and calving ease (birth weight) should receive the most attention in selection programs.

8) Reaching puberty at an early age is important in maximizing life cycle efficiency.

9) Acceptable market weight range should be the major consideration when decisions are made regarding breed size (type) and mating systems.

10) To improve beef production efficiency, cow-calf producers should match cattle type with the environment (feed and climate).

11) Low levels of nutrition favour smaller breed-types, whereas high levels favour larger breed-types.

12) Cattle type should not stray very far from the economically available feed resources on the home farm or ranch.

13) Larger cows appear to be more efficient in northern climates than in southern climates.

14) A high-quality environment accommodates a relatively wide range in milk production potential, whereas a less-favourable environment does not generally allow heavy-milking types to be as efficient as low- to moderate-milking types.

15) Beyond the need for an optimum range in size to meet market weight criteria and to suit environmental adaptability, the impact of cow size on economic efficiency is minimal.

16) In most environments, cattle should not be extreme in any one production trait. They should be moderate in most traits so as to withstand the volatile changes that occur in climate, cattle prices and production costs.

17) Biological extremes seldom represent maximum economic efficiency for the commercial producer. To a point, the seedstock producer can justify an extreme, but there is danger when the extreme is viewed as the ideal for the commercial industry.

18) Success or failure in a commercial cow-calf enterprise is measured at the herd level, not at the individual cow level. A reasonable goal would be to maximize output (pounds) per farm or ranch without dangerously increasing risk (infertility, dystocia, high input costs, etc.).

19) What is a Functional Cow?

1. She works for you instead of your for her.
2. She is trouble-free.
3. If she costs extra time and labor, she is non-functional.

20) Culling on Functional Traits:

1. Udder soundness.
2. Feet soundness.
3. Cancer eye susceptibility.
4. Prolapse.
5. Disposition.

21) Breeds used in rotational crossing systems should be reasonably compatible in size and milk (not over 200 lb. spread in cow size and about 8 lb. spread in dairy milk production).

22) For rotational crossing, the larger, heavier-milking specimens in the British breeds and the moderate-size, moderate-milking specimens in the Continental breeds would appear to be compatible.

23) When all else fails, one should recall the formula for profit in a commercial cow-calf operation:

Net Return = Carrying Capacity X Reproductive Rate X Livability X Weaning Wt. X Calf Price Plus Cull Cow Salvage Value Minus Total Costs.

24) Under current conditions, there may be just as much opportunity for improving economic efficiency through the lowering of input costs as there is through increased output.

QUESTIONS AND ANSWERS

QUESTION: What happens to efficiency when people who have been using the smaller breeds, here in our dry south west, go to crossbreeding with Simmental and Charolais and then keep on breeding to those breeds?

ANSWER: There's certainly an advantage in using the cross bred cow in our commercial programs. When we use the new breeds on the British cows that we had we really got a boost, didn't we? We were just so charged up, we kept bringing that blood in. We got to the three-quarter stage in our cow herd, then we got to the seven-eights stage. We've got commercial cow herds of great big fifteen-sixteenths, Simmental cows, with great big calves. We're getting more output, but as some of that data indicated, the input sides increasing faster than our outputs. That's the problem.

There's no solution; there's no easy answer except we've got to back up. We've got this big cow factory eating a lot of feed and it's to much. My recommendation is that we've got to go back to using British bulls to generate half-blood cows. The half-blood cow, can live and survive in any environment. Not the half-blood Holstein, but the half-blood Continental x British cross cow, can operate under about any environment.

But, we're going to have to bite the bullet and use some smaller breeds in the interim to generate back to this half-blood level in our cows. We're going to have some smaller calves for a while.

Now, we've also got to remember this. Our British breeds in the interim have gotten bigger and at the biggest level are nearly as big as our Continental breeds. At Denver the Limousin show was across the ring from the Angus

show. The Angus bulls and females in every class were bigger than the Limousines. They were taller and outweighed them. The biggest Angus bull calf was a Frame 10. I judged the Simmental show two days later. I didn't have a Frame 10 Simmental calf. British breeds at the highest level have almost caught up with the Exotics.

QUESTION: Do the three-quarter crosses come home "open" more often?

ANSWER: Yes, the first thing that we're going to see when we test the environment with these bigger, heavier milking types, these higher percentage types is a failure in reproduction. That's going to happen at about the three-quarter level because I think their maintenance requirements are enough higher, that they're taking more feed energy.

QUESTION: The few exceptional head of British Cattle that show up at Denver or Agribition or wherever do not represent the entire breed.

ANSWER Right, good point. Don't you Angus breeders start to feel too comfortable or that all your breed is large enough. There are still too many of those itty, bitty, furry black things coming through our sale yards. At Denver you just see the biggest ones.

QUESTION: Are cows in these trials AI'd with a random sampling of sires to avoid bias?

ANSWER: Generally yes, followed by a clean up bull. Any researcher worth his salt tries to sample as randomly as possible. They're going to random sample sires and do it well. If there was bias it was certainly not intentional. There are some people that shot holes in the Clay Centre data because they said the semen of some of those first Continental sires that was used didn't really represent their breeds. Well, the problem was, they only used bulls that were available. They had to use nine or 10 bulls because that's all there were back in 1968 or so.

QUESTION: Can you make a comment on some of the smaller Continental crosses, on what their effect would be on efficiency and reproductive efficiency, in particular?

ANSWER: That South Dakota work I showed you looks pretty favourable. If you remember one slide had the Tarentaise group come out 12 percent. ahead. I'm not promoting anybody's cattle, but we have to think of them as a biological type. Some of our more moderate milking Continentals might have a real role to play. Some of them have been kind of overlooked and maybe could come into play here, and be more efficient. We can do that within the Simmental breed too - pick a moderate type

QUESTION: With these more moderate Continentals, the more moderate cattle within the breed, would you say they could be used on the more extreme cattle within that breed or only on the British cattle?

ANSWER: I think we need to do both. I think we can mate the bigger end of our British cattle with the more moderate end of our Continental cattle and have a nice moderate cow. Within our big Continental breeds we've gone too far. I can say this because I breed them. I run some Chianina and Simmental of my own. We've got some of these cattle so big and so hard doing and so shallow ribbed with fleshing ability, you have to empty the grain bin to winter them. We've got these cattle in the big breeds too big, too racey, too shallow, too narrow, no fleshing ability; they don't breed back on time. We've done a lot of wrong things. We've gone too farm with these cattle. We've got to get some body, fleshing ability and thickness back into them

I'm not saying we give up growth but we don't need Frame 11's. End of sermon.

GROWTH PROGRAMS
AN IDAHO IRM CONCEPT

ED DUREN
UNIVERSITY OF IDAHO

The implementation of growth programs within a state essentially deals with two entities -- cattle and people. Basically, beef cattle become the vehicle for an educational thrust to motivate people involvement in profitable management alternatives.

The Idaho Total Beef Program is an educational integrated system based upon cattle management by objectives. The primary effects of cattle management by objectives may be observed in tangible results such as improved profits, shorter calving season, more rapid growth, increased calf survival, etc. The intangible effects may reflect pride in the ranch, self-satisfaction, peer recognition, improved employee morale, and strengthened team effort. These factors all have a direct and indirect benefit to the ranches participating and cooperating in the Idaho Total Beef Program.

The Idaho Total Beef Program (ITBP), developed by the University of Idaho College of Agriculture, is an action program designed for producer benefit and is in harmony with the priorities of the Idaho beef cattle industry. In reality, the Idaho TBP is an integrated systematic total approach for improving both reproductive and growth efficiency, demanding a team effort to problem solving.

Technology Base

Cattle management by objectives is essentially a system of incorporating known scientific technology into a more logical and effective pattern which requires a systems analysis to enhance the rate of adoption. Therefore, a total program demands the application of appropriate technology from diverse disciplines within animal agriculture.

A research assessment of animal agriculture accrued through the USDA-land grant system resulted in a practical handbook of applicable beef cattle production technology. This reference presents a management system based upon the biological cycle of the beef cow.

The "**IDAHO COW-CALF MANAGEMENT GUIDE**" and "**CATTLEMAN'S LIBRARY**" is published by the University of Idaho College of Agriculture and distributed by the Idaho Cowbelles in cooperation with the county Cooperative Extension Service offices throughout the state of Idaho for a fee of $35. This reference is supported by appropriate audio visual aids; i.e., twenty-four videotape and slide-tape cassette lessons utilized in various extension teaching methods. The technical information offered in the Idaho Total Beef Program includes the "**IDAHO COW-CALF MANAGEMENT GUIDE,**" "**CATTLEMAN'S LIBRARY,**" and appropriate audio visual aids. Each can be continually updated with practical and reliable information gathered from cooperating ranches throughout various Idaho Exten-Search type projects.

Subsequent Idaho beef symposiums on the four key indicators expanded the technology base with published proceedings as listed.

Year	Key Indicator	Theme
1979	Open Cows	"Live Calf...A Key to Pleasure"
1980	Calf Death Loss	"Calf Survival"
1981	Length of Calving Season	"Roadblocks to Calf Profit"
1983	Growth	"Growth, the Total Product"

The "IDAHO BEEF HERD IMPROVEMENT PROGRAM," a computer analysis of herd records, is a vital tool with a management input to system analysis as influenced by reproduction and growth. Performance records in commercial herds provide producers with information for maximizing growth management of their herds as well as individuals within their herds. These records can be used to pinpoint factors in the environmental system that can be changed so that growth potential will be maximized and potential profit increased.

The Idaho Beef Council has funded a substantial financial grant to the University of Idaho Cooperative Extension Service to generate microcomputer software to strengthen educational thrust of the Idaho Total Beef Program, an IRM concept to improve reproductive and growth efficiency.

The second phase of the Idaho Total Beef Program, the growth management of stocker cattle, is in the process of being developed, beginning with a companion technical reference of a "STOCKER MANAGEMENT GUIDE" and "CATTLEMAN's LIBRARY" for the western region

Problem Oriented

Beef cattle will respond in a given environment to the limit of their genetic capability or to the limits set by the environment. The environment is everything that interacts with that beef animal.

The environmental system must be managed properly to optimize growth and maximize economic returns. Then it is understandable, a manager must learn how to analyze the system and measure progress. Bench marks arrived from field data must be established for the key indicators in the cow herd management. Reference data can be utilized to identify problems and measure progress in the management by objective.

Currently, the educational thrust of the Idaho Total Beef Program is to improve the reproductive and growth efficiency of the cow herd. This direction and emphasis resulted from the collection of base data with both producer and professional cooperators. Examples of typical ranch data do appear with each measurable key indicator.

Measurable Indicators

There are four production **KEY INDICATORS** of the management level in a commercial cow herd.

The first of these, and the one that has the largest economic impact is **OPEN COWS.** If it takes $350. plus to keep a cow for a year, it doesn't take long to figure out that 14-20 percent open cows will knock a large hole in the budget. The number of open cows is a herd performance record that anyone can keep. This information is readily available in the fall if cows are preg tested, and available in the spring by simply counting the dry cows.

As an example, in the fall of 1981, the Idaho Extension Livestock Specialist's 841 Planning Unit conducted a survey for open cows. The results are rather interesting. Six veterinary clinics cooperated in the survey with thirteen practicing veterinarians reporting their pregnancy examinations on client beef cow herds. The participating clinics were located across southern Idaho. The following table summarizes the overall results:

Total Cows and heifers 17,378
Percent open . . . . .11% (Range 0-25%)

The open cow problem is about what you would expect in Idaho. The problem becomes much more serious when you combine those cows that are calving 80+ days into the calving season with the 11 percent open. You are looking at roughly 26% of the cows as reproductive failures.

The second **KEY INDICATOR** is the **LENGTH OF THE CALVING SEASON.** In those cows herds that do not have a seasonal calving system, days from the last

calving or calving interval is the **KEY INDICATOR.**

In the 1981 survey summary, one can observe less than 50 percent of the cows will calve in the first 40 days of the calving season.

Percent calving in first 40 days - 46%
Percent calving in second 40 days - 28%
Percent calving in 80+ days - 15%

A reproductive failure then becomes a growth inefficiency. This is important when you realize for each day one calf is younger it will be 1.5-2 pounds lighter in weight. One heat period of delayed breeding resulting in a longer calving period represents a calf weight loss of 30-40 pounds per heat period; producing a lighter weight calf at weaning, the normal sale date of many western ranches. When translated into dollars, a long calving season becomes the biggest "robber" in the beef industry. In terms of paying bills with those lightweight calves, reproductive inefficiency is the major problem in the herd.

The third **KEY INDICATOR** to analyze is **CALF DEATH LOSS.** These losses may vary among ranches but seem to range from 2-3 percent on some ranches and up to 25-30 percent on other ranches. The reason for this wide range can be attributed to the annual variation in ranch management and the accuracy of the reporting. We are beginning to get a handle on this in Idaho. Annual calf losses will vary somewhat by season but are consistent with ranch management. Preliminary indications are that annual baby calf losses vary from 12 to 40 percent or more on many Idaho ranches. Nationally the USDA statistics suggest annual losses in a range of 12-15 percent. It is most important that this key indicator of production is determined on a herd, country and state basis.

The fourth **KEY INDICATOR** of reproduction is **GROWTH.** Beef cattle management is really growth management. Growth being the major product sold. It is important to realize that total growth of the herd is a composite growth of the individual's and the total growth produced by the herd. There are actually two systems which impact growth; namely, the **individual's growth**, which is a product of the **breeding system**, and the total **herd growth**, which is a product of the **management system.** It is the management system that sets the priority limits of tolerance for open cows, length of the calving season, death loss, and minimums of growth.

Key Causes

Now, if you analyze the production system from these four **KEY INDICATORS**, there are only four **KEY CAUSES** of variation in levels of production in each of these. Let's run an example of open cows through the system analysis flow chart to see what happens. (Refer to Boise River Project Flow Chart.) Remember there are only four **KEY CAUSES** to open cows.

NUTRITION is usually the first cause that comes to mind. This is legitimate because nutrition is without doubt the most common problem in getting cows to breed and conceive. In the Boise River Project, nutrition was a significant problem revealing a mineral deficiency which, when corrected, produced measurable results in conception rate.

The second thought that comes to mind is **DISEASE.** There are some diseases implicated in the open cow picture. Most of the health problems in reproduction can be dealt with very successfully. However, another problem with open cows may be **REPRODUCTIVE SOUNDNESS.** Sometimes bulls are not as fertile as they could be, nor as young, and are not as sound as they once were. Maybe there are not enough bulls for the terrain. There are a number of reasons why bulls could be the cause of some open cows.

We can't get **MANAGEMENT** or environmental manipulation out of the picture as a possible **KEY CAUSE.** Management at this point is gross

management; i.e.: Were the bulls out? Did the cows have enough feed? Were the females cycling?

What is the next step in analyzing the system? Let's take the possible **KEY CAUSE, DISEASE**, and follow it through some steps of the analysis flow. There must be some key things to do to determine the possible cause of open cows in relation to disease. As far as disease is concerned, there are two things we can do. We can give the cows a physical exam to determine their reproductive soundness and give them a clinical exam to determine if disease is implicated. The clinical exam revealed that Vibrio was probably the key problem. The next logical step is to recognize that a change in the system of management needs to be made. The **KEY CHANGE** would be a vaccination program for Vibrio.

The **KEY MANAGEMENT CHANGE** (i.e., Vibrio vaccination) can then be measured back against the base data for some **KEY RESULTS**. In this case, it should show up as a decrease in the number of **OPEN COWS** as a **KEY INDICATOR** of production level. If management changes do not impact the key indicators, they may not be too important in contributing to the production efficiency of a cow herd.

Impact Projects

The system analysis approach of the Idaho Total Beef Program is practical and sound. This has been successfully executed and demonstrated on two completed Idaho field projects with several other projects now in the planning, development, and implementation stages of three to five years. The two completed projects were identified as Pegram and Boise River.

Pegram

One was the Pegram Project (3 herds, 1600 cows) in southeast Idaho. The **KEY INDICATOR**, baby calf death loss, was reduced from 26 percent to less than 2 percent in a three-year period.

The key objectives of the Pegram Extension Search Project were to:

1. Prioritize and implement management changes to minimize death loss in young calves.

2. Develop an effective economical disease control program to minimize death loss in young calves.

The ultimatum of the Idaho Beef Council, associated with the funding of this project was to develop a system for saving calves with any or all known and unknown techniques that can be profitably demonstrated to a cow-calf producer. The Idaho calf survival problem , readily identified by the Idaho Beef Council, became an industry crusade and a University of Idaho challenge which attracted national interest by the beef cattle industry.

Boise River

The Boise River Project is a method and result demonstration where the problem was open cows. At least this was the point of trauma to the rancher when 23 percent of 350 cows were diagnosed open. Fortunately, this rancher had two years of herd records. He had — in addition to 23 percent open cows -- a 140-day calving season, 7 percent death loss in calves and 352 pound weaner calves at about 250-days on irrigated pastures. By going through a systematic analysis on each of the four **KEY INDICATORS**, it was discovered that the major cause could be a mineral deficiency — selenium and copper. The **KEY MANAGEMENT** change made was a mineral supplementation program. Herd performance the succeeding year resulted in 93 percent conception, 60-day calving season, and 1.5 percent death loss. Weaner heifer calves were 87 pounds heavier and steer calves were 60 pounds heavier than the previous year. For more complete detail, see the attached flow chart on the system of analysis.

Calving Management Workshops

Calf survival is a recognizable problem of the nation's cow herds at all input levels of the beef cattle industry.

The problem of calf death loss is identified with a breakdown in reproductive management. Reproductive management is a high educational priority of the NCA-Industry Extension Beef Resource Committee.

A typical example has reflected the producer concerns of calving management workshops as a lead to implementing county Total Beef Programs. These workshops employ th experience and expertise of Universiuy of Idaho staff with teaching support from practicing veterinarians and selected experienced producers utilizing information generated from the Idaho Pegram Project.

These workshops provide a "hands-on" experience for the young beef producer as the target audience. Approximately 36-40 hours of intensive instruction is offered via formal lecture (15-20 hours) audiovisuals, both videotapes and slide-tape cassettes, field technique demonstrations, calving equipment, and ranch tours.

Generally, the workshops scheduled during the onset of calving in the area are conducted within a week's time. On occasion, two workshops in adjacent counties may be conducted simultaneously with extension agricultural agents coordinating and scheduling the instructors to service both workshops, thus resulting in a more efficient use of professional staff time, travel and expense.

The normal producer charge ranges from $35. to $50. per person, depending upon cost involved in conducting the workshop. Each participant received a calving management notebook containing information presented by the instructor.

The successes of the workshops have been attested to by both ranch owners, namely the fathers, and ranch managers. In the words of one father, "My son learned more about calving cows at the workshop than I have in a lifetime." Practicing veterinarians have observed the workshops to be helpful in establishing their professional services and capabilities to clients served. Agricultural lenders have indicated that participating ranchers have saved more calves during the season through management changes thus resulting in an increased cash flow to the ranch operation.

The teaching materials and audiovisuals are selected from the Idaho Cow-Calf Management Guide and Cattleman's Library published by the University of Idaho College of Agriculture.

Calving Management Workshop participants respond more enthusiastically to the hands-on educational process of the workshop in contrast to a typical extension "road show type" one-day meeting of cafeteria-style information. The basis for this is that the workshop provides an educational foundation upon which to build the educational interest of the producer in a problem-solving mode. The sharing of experience and technical information flows freely and with confidence between participant and instructor.

Once a workshop has been conducted, participants rapidly pursue the implementation of the technologies shared and the application of this information to their associated ranch. Within a relatively short period of time, one to two calving seasons, professionals readily observe marked changes in herd management on participating ranches. These changes can be measured.

Agricultural Lenders Seminar

A series of seminars by geographic regions in Idaho have been successfully conducted by the University of Idaho to acquaint agricultural lenders with the Idaho Total Beef Program. The seminars were sponsored by IMC, Veterinary Products Divsion.

Agricultural lenders, during the loaning process, assist producers in analyzing the status of herd

management. This is accomplished very easily by simply reviewing the Cow-Calf Management Checklist available to all Idaho agriculture lenders. The Cow-Calf Management Checklist serves to identify and prioritize areas of management which may assist in improving the reproductive efficiency of the herd by allocating financial resources and seeking the appropriate technology.

The checklist also offers insight to county beef program planning committees in meeting the educational needs of beef clientele. The Cow-Calf Management Checklist was developed by cattle industry wide participation in the 1983 "Make It Happen" workshop sponsored by the Idaho Cattleman's Assocation and the Idaho Cattle Feeders' Association in cooperation with the University of Idaho College of Agriculture.

People Involvement

In response to the frequent inquiry, "How do you start a program?", the astute extension workers start with people -- both beef producers and professionals. Furthermore, the program begins where the key people perceive the problem, which logically can be categorized within any one or more of the four key measurable indicators.

At that point forward, the educational process begins to take shape from a suggestion in the committee meeting to the final successful solution, all within the framework of the multi-discipline and multi-functional problem-solving mode.

In developing a state or county Total Beef Program, it is motivated by knowledgeable key people willingly contributing to a data base. Field data; i.e., open cows, dead calves, etc., is essential to problem identification, priority determination, and program direction by beef industry leaders.

Participation, involvement, motivation, and commitment are the instruments in getting the act togeter. With people in place fully informed, the educational process will result in a "hands-on" experience long to be retained.

The Idaho TBP is not the reference material, computer software, or the "road show" meetings; but more specifically, it is a line of action which involves the cooperation of people in the educational process to speed up the rate of adoption and flow of technical information from scientist to producer.

The impact of the Pegram Project is an example of the Idaho Total Beef Program — a concept in Integrated Reproductive Management to improve beef cattle reproductive efficiency in Idaho. This program began where the problem was perceived, which was attuned to the survivability of neonatal calves. The Pegram Project, conducted on working ranches in southeastern Idaho, represented a combined involvement and interest of people from the ranches, Idaho beef cattle industry, agri-business, and the University of Idaho College of Agriculture.

Professional Support

Implementing a Total Beef Program is one of integration. The technical information applicable to total ranch management must be supported by professionals in the delivery and application of the technical information. Each individual associated with a ranch or county program has a challenging role to play in developing and implementing a Total Beef Program. The educational impact to the professisonal dwells with each contribution in the total process. Professional people are categorized into several groups based upon previous training and experience. Each professional team member will play a significant role in the technology integrating process contributing to the problem-solving mode if their efforts are organized and properly stimulated. A complete understanding

of their role is important to team cooperation.

The research scientist is technically trained to structure problem-solving activities in terms of statistical replicas with treatments and controls which are the parameters of a research project. They tend to build projects requiring continued study and refinement. Frequently, a research scientist will experience total frustration in an attempt to study field problems on a ranch as opposed to a research project on an experiment station.

The extension scientist is relatively unstructured in the sense that no two receipients of the same technology are the same, nor do the results have to be the same. The experience with people combined with technology can bridge the gap between the experiment station and ranch environment.

The practicing veterinarian in the animal healing arts associated with crisis management reacts successfully in the face of outbreak and often becomes less interested in preventing the crisis. In other words, don't fix it if it isn't broken!

An agricultural lender is basically trained to analyze monetary repayment ability with little regard to the producer or ranch management. However, recently bankers have demonstrated a renewed interest in management and can be extremely vital contributors in an integrated program.

The producer is a recipient of technology and ultimately responsible for the integration resulting in ranch management change. Frequently, the producer may be steeped in tradition, bound by peer pressure, and restricted to family structure with each independently or in combination influencing the rate of adoption of technology delivered.

The industry representatives of animal health and nutrition products operate within the confines of product sales to the parent company. In these attempts to meet the sales quota the representative may often fail to recognize the management level of the ranch. Most products result in a higher return in proportion to the management applied and must be considered accordingly for the dollar invested.

In beef cattle production man is the organism that has the greatest impact. The decisions that men can make influence all of the effects of an integrated cow-calf management system affecting reproductive efficiency.

Committee Input

In the implementation of an education program (i.e., ITBP-IRM) planning with people is more effecive than planning for people. The input of an industry recognized planning committee must be acknowledged in successful Cooperative Extension Service programs to identify the beef industry needs and to determine problem priorities for an effecive education IRM program.

The allied professions eagerly contribute expertise in the resprective fields of financial analysis, health, and nutrition. This involvement may come from agricultural banks, practicing veterinarians, feed stores, and national animal health and nutrition companies.

Communications are paramount. They ranged from one-on-one contact to periodic semi-formal committee meetings or formal brain-storming type conference and hands-on type workshops supplemented with appropriate results demonstrations. The dialogue among people built upon confidence and commitment remained open and honest.

The role of each committee member is to represent the producer and professional by recognizing observations, problems, and priorities as it may influence financial and social welfare of a community, country, or state. Obviously, these people serve without compensation as a civic duty.

Frequently, they may become disillusioned with their role, duties, or responsibilities if not allowed to become deeply involved. Then the question may arise, "What's in it for me?"

The financial welfare is important to those who derive their living and income from an industry. Current information in the flow helps to stabilize an industry and make it more efficient. This is true with the beef cattle industry in addition to the other agriculture commodities.

Educational Process

The Idaho Total Beef Program is with the Idaho beef industry commitment: a University of Idaho College of Agriculture educational thrust for improving the reproductive efficiency of the state's beef cow herd. It is a total college effort to provide technical information and enthusiastic leadership to cattlemen managing the cow herd.

During the initial stages in the planning, developing, and implementing of a Cooperative Extension Service educational thrust with the Idaho Total Beef Program, the county extension agent is responsible for the leadership but must frequently rely heavily upon the advice and guidance of the industry leaders. This generally comes about through a series of planning meetings composed of a selected group of beef industry leaders representing producers, agricultural lenders, practicing veterinarians, and agri-business; namely, feed and animal health suppliers. Frequently, the input of these key people reflects immediate concerns of cattle ranches within the current season of activity and during the entire year.

Producer awareness to the problem associated with a weakness in reproductive efficiency within the herd is a result of a series of educational activities and county extension functions. Each activity must build upon the previous activity and not be an end to itself. The activities may be the result of applying one or more educational tools of support that may include -- but are not limited to -- meetings, demonstrations, committees, impact projects, audiovisual aids, or Idaho Cattleman's Handbook.

Change does not cease with the ending of the activity; i.e., workshop. Producer participants become conscious of other ranch problems, seeking professional assistance in solving these problems by integrating appropriate support from various sources in a team effort. Consequently, a team composed of extension agriculture agent, veterinarian, banker and producer becomes more involved and more effective in dealing with the respective ranch. As problems are attacked on a team basis, the challenge becomes a part of the motivation to the key people involved to rapidly integrate by developing and implementing the Idaho Total Beef Program for a specific ranch or a group of ranches within the community.

The Idaho Total Beef Program is a building process in a problem-solving mode based upon the integration of scientific information as applied to one or more ranches within a community associated with a common problem. The program can be directed to a ranch, a community of ranches, or a countrywide extension educational beef program for which a problem of concern has been identified. The Idaho TBP is definitely a problem-oriented action program of integration to improve reproductive efficiency of Idaho's cow herds. Progress in the Idaho TBP can be measured with appropriate key indicators selected from established bench marks reflecting the problem, cause, and effect of cow management.

Therefore, under the system of analysis, the Idaho Total Beef Program continues to grow much like the growth performance of cattle from birth to slaughter under the environmental influence of management. The problem-solving mode moves from the simple to

the complex and with selected key indicators, the results are measurable! The full impact of the Idaho Total Beef Program is never fully realized simply because it is open ended and can apply to all levels of management and technological capabilities.

Once a line of action becomes established, the Idaho Total Beef Program develops with success and satisfaction to all involved. This then becomes a most stimulating activity in the educational process of the land grant institution.

The Idaho Total Beef Program is a total systems approach for integrating both technology and people in a problem-solving mode to achieve results in the management by objective of a commercial cow-herd.

Contrary to popular belief by many industry representatives and professional staff of the Idaho land grant institution, the handbook does not constitute the Idaho Total Beef Program. The handbook is simply a ready reference of technical information.

The program constitutes a logical progressive line of action supplemented with educational activities, each contributing supporting information delivered by involved competent people with a sincere interest in problem solving.

It is based upon people through change:

1. Problem identification - base data;
2. Technology transfer;
3. "Hands-on" educational activities;
4. Systems analysis;
5. People involvement and commitment;
6. Measurable results;
7. Improved delivery system;
8. Communication and accountability;
9. Professional problem-solving team; and
10. Integration of USDA and land grant units.

The Idaho Total Beef Program has been effectively demonstrated to be a continuous process of education successfully executed at the grass roots level by enthusiastic leadership. It can be implemented at community, county, state, regional, and national level with measurable results.

The IRM concept, if pursued in the development of educational programs in a systems approach, will ultimately speed up the rate of technology transfer, but will alter traditional land grand educational delivery procedures.

The Idaho Total Beef Program is truly a people program with both involvement and commitment extending from ranch cowboys through management and including consulting support from bankers, veterinarians, accountants, extension personnel -- each with a vital role to play in a dynamic thrust improving reproductive efficiency.

Summary

In looking ahead to management in the 80's, the day is gone when we can operate a cow outfit out of our hip pocket. We must remember we are the largest impactor on the production of our ranches because we manipulate the environmental system through our system of management. We must have a system of analysis on the **KEY INDICATORS** of level of production. We must be willing to change. All of the technology in the world is useless until it is incorporated into the management system. Seldom will we be successful unless we use an interdisciplinary approach. In Idaho we call it the Total Beef Program, nationally it is called Integrated Reproductive Management. You, who are producing cattle, need to obtain all of the technology available, and incorporate as much as you economically can into your management. Those of us in education need to be innovative in our efforts to speed the rate of technology adoption. We have read that from time of discovery of technology to general adoption is 7 to 15 years, 12 years average. This is definitely too long in these fast changing times.

BOISE RIVER EXTENSION PROJECT
(A Result & Method Demonstration)

300 Head Cow Herd
Flow Chart of TBP Approach

Data Ease	Key Indicator	Key Causes	Key Approach to Problem Isolation	Key Problems Identified	Key Management Changes	Key Results
PERFORMANCE RECORDS	Open Cows (23%)	Disease	Physical Evaluation Clinical Tests	No Problems No Problems		
		Bulls	Physical Evaluation Clinical Tests	1 Gimpy No Problems	Sold 1, Gimpy	
		Nutrition	Feed Analysis Clinical Tests	Low S_E, CU, C_A, P Low S_E, Copper	Supplement S_E CU, P	93% conception
		Management	Review Mgmt. Program Parasite Control Records-Summer Pasture	High Fly Population	Ectrin Ear Tags	Less flies
	Calving Season (140 days)	Disease	Physical Evaluation Clinical Tests	No Problems	Vaccination Program	60-Day Calving Season
		Bulls	Physical Evaluation Clinincal Tests	No Problems		
		Nutrition	Feed Samples Clinical Tests	Low S_E, CU	Preg test - cut off late only heifers of sufficient size kept and bred.	
		Heifer Development	Check for Size, Age, Check Perf, Records	50% large enough to Breed	Bulls in 1 heat then preg test	
	Calf Death Loss (7%)	Disease	No clinical signs of disease		Complete Vaccination Program & Bose	
		Nutrition	Nursing	Supplement	Supplement	Reduction of 5.5%
		Management	Same as cows			
	Growth 352 lb w/w, 232 days/age	Nutrition	Feed Analysis Level of Feeding	Low S_E Low Copper	Supplement S_E, CU	Heifers 87 lb heavier than 1981
		Parasites Internal & External	Examine for ext. Int. parasites	High Int. Population Some external	Worm Calves Pour On	
		Disease	Check for calf diseases	Some BVD, PI_3 IBR Suspect	Vacc. Program for Calves	Steers 60 lb heavier
		Genetics	Examine Performance Records of cow herd & herd bulls	Variation In Performance	Cow Evaluation & Culling	

Key Activities to Adoption

Informational (Meeting)

A. Disciplines reported what each contributed to project results.

B. Process of TBP - Approach explained.

C. List of Producers present obtained - (70 producers present).

D. News media present - radio, TV, Press.

E. Notices of meeting sent to Livestock Producers on the Boise River.

F. Publish complete report of action on project.

Follow-Up (Survey of Producers)

Extension agents surveying for base data from each producer attending meeting.

(Analysis of Data Collecting).

1. Identify areas of opportunity and impact key production indicators.
2. Identify possible areas of research.
3. Identify Producers that have similar data willing to co-operate in further demonstrations.

ACCESSING THE CALIFORNIA BEEF MARKET - A STRATEGY FOR FREE TRADE NEGOTIATIONS

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There has been considerable discussion over the last few years by Canadian cattlemen, governments and academics about the possibility of exporting increasing quantities of Western Canadian beef to markets on the West coast of the U.S., especially California. The amount of increased exports to this area does not, as yet, appear to be significant. The question then arises, is there a large untapped market for Canadian beef in California? The answer appears to be that yes, there is a fairly large market and that it remains as yet untapped. The proposed Canada-U.S. free trade talks, however, may provide an excellent opportunity to access the West coast market. Successful market expansion into this area will depend, to a great degree, on how well Canada fares at the negotiating table.

There appears to be a great deal of confusion in the agricultural community and, for that matter, in Canada generally about what will be the reality of a "free" trade agreement with the U.S. The confusion arises partially because Canadians have little experience with such agreements and secondly, as yet, the governments in both countries have not yet formalized the process of negotiation. To gain some insights into what free trade is likely to mean one needs to examine the reasons why Canada is entering into trade discussions with the United States.

The first question to ask is, why does the Government of Canada wish to pursue a policy of trade liberalization with the U.S. and why at this particular point in time? The major and most fundamental reason for seeking a trade agreement is the frustration of governments and other groups with lack of growth in the Canadian economy. Basically the Canadian economy has not grown significantly since the late 1970's. Looking at year to year changes in GNP is somewhat misleading. Certainly there have been some small gains but compared to the 1950's, 1960's and early 1970's when there was sustained growth, the economy has virtually ceased to grow.

Until recently most economists thought that judicious fiscal or monetary management of the economy to reduce cyclical fluctuations would provide sufficient conditions for sustained economic growth in a modern economy. The post-World War II period appeared to provide adequate evidence to support this hypothesis. For reasons which are not clear - or at least for which there is no consensus among economists - in the later 1970's the Canadian economy no longer exhibited sustained growth.

It is reasonably clear now that when the economy ceased to grow governments were caught somewhat unawares. The result was the huge deficits which are currently manifest. Over the long period of growth governments had, in part, financed their expenditures through debt financing. This did not present any particular problem if the economy was growing because increased economic activity in the next year provided sufficient increases in tax revenues to prevent any major increases in budget deficits or the national debt. Governments are not the only actors in the economy who contracted large debts based on expectations of growth. Clearly many members of the farm community borrowed very large amounts with the expectation of increased returns which subsequently did not materialize due to the poor performance of the Canadian and to some extent the world economy.

In any case attempts to finance government expenditure to mildly stimulate the economy did not bring forth the expected growth and increased tax revenues. Only a few years of poor growth performance was sufficient to build up both large deficits and the resultant increases to the national debt. Hence the large accumulated debt was not the result of fiscal irresponsibility and mismanagement by government, the reason which is often trotted out as the "whipping boy" to explain our economic troubles, but rather the unanticipated lack of growth in the Canadian economy.

The result has been, of course, a huge debt which requires approximately twenty-five cents out of every dollar collected in taxes to cover the interest payments. Heavy government borrowing requirements, in addition, put upward pressure on interest rates, both in the U.S. and Canada. This greatly reduces the government's room to maneuver. With no growth any attempt to reduce government expenditure to cut the deficit results in less people working and decreases demand for goods and services which further depresses the economy. Increasing taxes, the alternative, again reduces the money which indiviuals and businesses have to spend and again decreases demand. Basically the only way to return some degree of flexibility to the management of the economy is to induce it to grow. Growth would mean increased tax revenues without the need to increase taxes.

As the traditional means of inducing the economy to grow do not appear to be effective at the moment, and in any case the room to maneuver is very limited, governments have begun to look to alternative policy measures to foster growth.

Trade liberalization is one of these alternatives but it is by no means the only avenue being explored by the current federal government. Attempts are being made to find ways to deregulate the economy so that businesses can better take advantage of opportunities for expansion and are not forced to expend as many resources in order to comply with existing regulations. Another policy aimed at promoting growth which the government has been pursuing is the formal encouragement of foreign investment. The revamping of the Foreign Investment Review Agency (FIRA) and numerous speeches by members of the government in the U.S. and other parts of the world have been an attempt to place investment opportunities in a more favourable light. Even such novel policies as entrepreneurial immigration are being explored. In other words Canadian immigration policy would be changed to encourage those who are willing and financially able to start a business to immigrate to Canada. Hence, trade liberalization is only one of many policy options.

It should be remembered that the real reason to move to trade liberalization is to induce the economy to grow. Growth is crucial, otherwise Canadians will remain at the same standard of living and will be reduced to fighting over a fixed economic pie. It is extremely important, however, to understand the underlying premise upon which trade as an "engine of growth" is based. It is not increased exports. Increased exports are only the end result of growth from trade. Certainly for an individual company or even an industry increased exports will be manifest and that will be where the perceived benefits from trade will come.

Increased trade however is first of all a two-way street - it means increased imports as well as increased exports. The fundamental proposition of the economic theory of trade is that through trade resources are transferred to those industries and commodities which we produce efficiently. Some of the resulting increase in output will become increased exports. On the other hand resources are also transferred out of those industries and commodities we produce inefficiently and the reduction of output in those industries is made up by extra imports. **Growth from trade**

comes from the transfer of resources from inefficient to efficient industries.

Such movements of resources are not easy in the short run. The process is not costless. It will create losers in the short run and no one wants to be the one who suffers losses - to lose one's job or one's livelihood or to change occupations in mid-life.

Even if the transfer to the expanding industry does take place there is no assurance for any individual that his job in the expanding sector will be as well paying as the one he was forced to give up. Skills, knowledge and experience gained in one sector are unlikely to be as valuable when applied to another sector. This applies to business executives and farmers as well as labour. There is no other way to get growth from trade except by effecting the transfer of people and other resources.

One can certainly initiate programs, as a government, to help those who will lose to make the transition - job training, moving subsidies, employment information, grants for conversion of plant and equipment, etc. As yet there has been very little indication from governments as to what the losers can expect in the form of programs to ease the transition. It is no wonder that one finds resistance to trade liberalization. If some assurances can't be given to those who will be adversely affected the whole process may be "scuttled" by those who know they have a lot to lose.

Already the protagonists are getting their positions in place. Those in the pro-free trade faction perceive the huge U.S. economy as an almost unlimited market for their products. All they desire is the chance to exploit its potential. The anti-free trade faction, on the other hand, sees itself threatened by a flood of cheap imports from U.S. industries which have considerable economies of scale and low prices. Of course both are right and most industry officials have a pretty good idea what their competitive position is in regard to their U.S. counterparts. Already much of the discussion on free trade is from the point of view of "vested interests" and should be scrutinized closely. Still, if there is to be any growth from trade liberalization some industries will become less viable and employment in those areas will be reduced.

The next question to ask is, how easy will it be to arrive at a trade agreement? In the past Canada has negotiated a number of trade treaties with the U.S. (1). The old term was reciprocity. Only one reciprocity agreement was implemented, however, in 1854. Although not particularly easy, negotiation of trade treaties in the past was a far simpler process than today. This is primarily because government presence in the economy is now extensive. Unlike 1854, government interference in the economy encompassed a myriad of regulations, social policies such as unemployment insurance and medicare, regional development incentives, and tax incentives, all of which will have some impact on trade flows.

Trade liberalization does not mean, however, that all social policies must be abandoned. The U.S. as well as Canada have a large number of policies. The U.S. uses the term "level playing field" when discussing the conditions it requires for a trade agreement. The concept of the "level playing field" relates more to "fair" than "free" trade. Basically, it means that the effects of policies or programs needs to be approximately equal in effect, not that they must be dismantled.

In the future, if there is a trade agreement it will mean that there will have to be increased harmonization of policies between the two countries. One problem for Canadians, however, is that we know far less about the U.S. economy and its government programs than the U.S. knows about our programs. The U.S. economy is large and complex and in addition to the

federal government there are fifty state governments each with their own sets of regulations, subsidies and taxes. As yet there has not been a great deal of effort in Canada to research and interpret the effects of U.S. programs. To be well prepared for the negotiations will require considerable expenditure of resources and effort by Canadians. At the moment we appear to be behind in this area and should be increasing our efforts.

One of the anomalies of the Canadian approach to negotiations is the suggestion by Mr. Reisman, Canada's chief negotiator, that the process should be done as inexpensively as possible. The impending trade negotiations with the U.S. are likely to be the most important economic undertaking by Canada until the turn of the century. Both our best minds and adequate resources should be made available so that the negotiators are as fully prepared for the process as possible. Reaching an agreement over trade liberalization with the U.S. will be difficult but reaching an agreement which will, as much as possible, benefit Canada will depend on the thoroughness of our understanding of the U.S., especially their government policies and programs.

The third question to ask is, what does free trade actually mean? First the term "free trade" is a misnomer. What will result from an agreement with the U.S. will be some process of trade liberalization. It will be what Canada negotiates - what can be obtained from the U.S. in concessions and what Canada can retain.

Thus the negotiators need to have what Canada desires from a trade agreement well organized and what can be conceded priorized. A modern economy like Canada is made up of a large number of very complex industries. For each industry the desired requirements of a trade agreement will be different.

The actual number of negotiators will be few and the problem for each Canadian industry is how to ensure that the negotiators are well informed of the requirements and concerns of their particular industry. The so called "poker chip" phenomenon is well known. Basically negotiations are a bargaining process and negotiators must have "bargaining chips" for progress to be made. For example, to gain market access for Canadian lumber in U.S. markets it may be necessary to allow the U.S. market access to some protected Canadian industry. If the negotiators are not fully informed of the complexities of a particular industry, then there is an increased likelihood that the negotiators will trade away something which is of vital interest to a particular industry.

Individual industries cannot rely on governments to develop their lists of desired concessions and to identify what is vital to retain. Canadian governments don't have the resources or expertise to develop the positions for all industries. For example, Agriculture Canada must be concerned with the hundreds of commodities which we trade, or could trade, with the U.S. Certainly Agriculture Canada has considerable staff but the assessment of trade requires a particular expertise. One cannot expect someone who is an expert on animal diseases or fruit trees to become an expert on assessing the needs of an industry in trade negotiations. It is members of the industry who deal in the markets on a daily basis who will understand the complexities of the markets and who will know what is required. There does, however, appear to be considerable complacency by some Canadian industries. They appear to have the impression that someone else is looking after their interests. There is probably no better way to become a "poker chip" in the bargaining process.

Basically it is up to each Canadian industry to ensure that it is well represented in the negotiations. They must be prepared to spend the resources necessary to articulate their requirements and to to get as close as possible to the negotiating process itself.

The final question to ask is, what should be the time span of any trade agreement? Trade treaties often carry abrogation clauses which specify when and under what conditions one country can "opt out" of the agreement. Especially for industries such as the Canadian meat processing industry, a long term non-abrogation clause is required. If the treaty could be abrogated after a short time, say five to ten years, then little or no investment would logically take place in Canada. If one were to build a large new Canadian plant to take advantage of the U.S. market, and one country left the agreement resulting in a closure of the border, one would be left with access to only the Canadian market of approximately twenty-five million. On the other hand if the plant was constructed in the U.S. and the border was closed the plant would still have access to a market in excess of two hundred million people. If there is only a short term non-abrogation clause neither Canadian or U.S. firms would logically invest in new Canadian plants. There would, hence, be a loss in value-added and jobs to Canada. It seems clear that twenty to thirty year non-abrogation clause will be required in the agreement.

Although the movement to trade liberalization appears to be fraught with risks for Canada the do nothing or status quo option appears more hazardous. Protectionism is on the rise in the U.S. Although much of the U.S. trade difficulties currently arise from their large deficit, and the resultant high interest which puts upward pressure on the value of the U.S. dollar, there is a perception in the U.S. that it deals in a world which, by and large, trades unfairly. Hence, at risk are $1.2 billion in Canadian agricultural exports annually, half of which came from Western Canada. Currently there are more than three hundred protectionist bills before the U.S. Congress. In general, the U.S. is not specifically concerned with Canadian trade policies. In their attempts to protect their industries from the EEC and Japan, however, the U.S. is likely to implement trade restrictions which also affect Canadian exports.

Currently, in the U.S. it would appear that it is only those closely associated with the Reagan administration who are committed to free trade. President Reagan cannot, of course, run again. If the next president is a Democrat, given that party's close association with organized labour, protectionism is very likely to become the preferred policy. Even if the next president is a Republican there is no reason to believe his administration will be as philosophically committed to free trade as is the current administration. If Canada and the U.S. are near to a trade agreement in 1988, existing Canadian market is probably reasonably safe.

If there is no agreement and protectionism comes to the fore in the U.S. then the resulting restrictions to Canadian market access are likely to have far more serious effects on the Canadian economy than, for example, the last recession. Currently twenty to twenty-five percent of our GNP is generated from trade with the U.S. Even a reduction of five percent in this level would have a very detrimental effect on the Canadian economy. Certainly the U.S. would not close the border entirely but a twenty to twenty-five percent reduction in exports is not inconceivable.

There has been some discussion in Canada for exempting the entire agricultural sector from any trade agreement. Such an exemption would seem unlikely as the U.S. wishes agriculture to be included. The U.S. wishes agriculture included, in part, because it perceives increased market opportunities in Canada for U.S. agricultural products. In addition one of the few major backers of the administration on the general issue of trade is the agricultural sector. If agriculture were excluded from an agreement with Canada the administration would likely lose the

support of agricultural interests in the U.S. which would seriously weaken its efforts to forestall protectionist pressures.

In addition the U.S. wants agriculture on the table at the next round of the GATT negotiations. Having agriculture excluded from the trade negotiations with Canada could set a bad precedent for the GATT and the U.S. is hence likely to press for the sector's inclusion. The U.S. could also use a successful agreement on agriculture in Canada-U.S. negotiations, as a model for procedures in the GATT negotiations to reduce agricultural trade barriers. In short an agreement, if well negotiated, could be to the long term benefit of Canada and agriculture is likely to be an integral component of any such agreement.

Given this particular setting for trade negotiations what are the prospects for beef exports to the West coast markets in the U.S.? Basically there appears to be considerable market opportunities on the West coast, especially California, but accessing those markets will be a function of what Canada can negotiate in the trade liberalization agreement with the U.S. Basically it will depend upon what one requests in the negotiating process and from that list what one can obtain in the negotiating process.

There will be four major issues which will arise in the trade discussion: (1) tariffs, (2) non-tariff barriers, (3) domestic institutions, and (4) subsidies. Tariffs are the taxes which are levied on goods when they cross the border. Non-tariff barriers are basically anything which is not a tariff but which can be used to interrupt or reduce the cross border movements of goods. Non-tariff barriers are basically limited only by the immigration of those who wish to limit the movement of the particular commodity. They may be very formal. An example of a formal non-tariff barrier is a quota on a product which limits the number or volume of the product allowed to be imported. Often, however, non-tariff barriers are less formal. The ban imposed by some U.S. state governments in 1985 on hogs which had been administered the drug chloraphenical is one example. Such barriers are particularly difficult to address because they often involve health regulations or protection for consumers which may have, at least a component of, legitimacy. Non-tariff barriers can be as simple as a tightening up of the strictness with which paper work is checked. It is almost always possible to find some fault with complex export forms.

Domestic institutions are those policy instruments which have been developed in an era of non-free trade and are in place to facilitate within country marketing or to accomplish goals of social policy. Such institutions operations may have effects on the flow of goods when tariff and non-tariff barriers are reduced. Examples of such institutions might be marketing boards or grading standards. Subsidies are those policies of farm income support or stabilization which transfer public funds to the farm sector either directly or indirectly through the distortion of factor prices.

The beef industry in Western Canada is likely to be one of the sectors which would benefit substantially from trade liberalization with the U.S. It is one of Canada's most efficient industries as a result of a number of years of poor returns. Even under the current trade regime the Western red meat industry is a successful exporter. Net exports (exports minus imports) of red meat out of Western Canada were valued at $366 million in 1984 and represent a 527 percent net balance of trade with the U.S. These exports have been steadily growing through the 1980's.

California, with a population of over 20 million, represents a very large market for beef. The California beef requirement each year is approximately 3.4 billion pounds. The state is not self-sufficient in production and imports approximately two billion pounds of its requirement from out of

state (2). The provinces of Saskatchewan and Alberta produce approximately one billion pounds of product. If only ten percent of the deficit in California could be filled from Canadian sources that would mean a twenty percent increase in production for Saskatchewan and Alberta. The states of Washington and Oregon are also deficit areas.

The California deficit is filled in part by Colorado, Wyoming, Utah, Arizona and New Mexico. The deficit is so large however that, at times, the state is supplied from as far away as Omaha and beyond (3). Calgary, Edmonton and Regina are closer than Omaha to some California markets.

Accessing the California market has been difficult for Canadian exporters. These difficulties arise, in part, because there are a number of regulatory and tariff barriers which increase the landed cost of Canadian beef in these markets. If they could be removed, Western Canadian products would be very competitive in the California market.

The question arises then, what barriers would the Western Canadian beef industry wish to see removed in any free trade agreement and what provisions need to be included in the agreement to ensure continued market access?

Tariffs on beef are not sufficiently high to be of concern except at the highest levels of processed product. The tariffs increase with the degree of value-added in the product, 1¢/lb. on live animals, 2¢/lb. on meat and a percentage of the products value for further processed products. As such the tariffs encourage the export of low value-added products. The tariffs will no doubt be removed in any agreement and hence should not be the major focus of the negotiating process.

Non-tariff barriers are the most important issue for the beef industry and their successful removal will require some special provisions in any trade agreement. Removal of the U.S. import quota on beef would be desirable. If invoked it leads to some direct loss of sales in the latter part of the year and this of course is costly and annoying to Canadian exporters directly. The indirect effects of the beef import quota are probably more important however. As is normal for most business concerns, U.S. beef importers like to be assured of continuing sources of supply. If a U.S. importer has been relying on Canadian product to fill a portion of his orders on a continuing basis, and the import quota is invoked, then the importer must find alternative sources of supply. Due to such security of supply considerations, it may be difficult for Canadian firms to regain their U.S. customers once they have found alternate and secure U.S. sources of supply.

Those non-tariff barriers which arise either from changes to regulations or due to inconsistencies in the strictness of enforcement of existing regulations are, however, those which are of greatest importance to the beef industry when the California market is considered. Such non-tariff barriers can be used to interrupt the flow of goods over short intervals. Market opportunities in California are not consistent. They tend to be for short intervals of a few weeks or less. This is illustrated by the figures on the following pages. Figure 1 provides weekly prices for the rib primal cut and Figure 2 for the chuck primal cut for the period 1980-1983. The prices denoted AAPP are the actual Alberta weekly average prices for Calgary. Those prices denoted LAEP are the Los Angeles price minus transportation charges, border inspection fees, brokerage fees, and tariffs. They are also adjusted for changes in the exchange rate. In other words this is the price, in Calgary, that a Canadian firm could expect if it made a sale at the market price in California (4). When the LAEP price is higher than the AAPP this indicates when product could be sold in Los Angeles more profitably than in Alberta. As the Figures

FIGURE 1

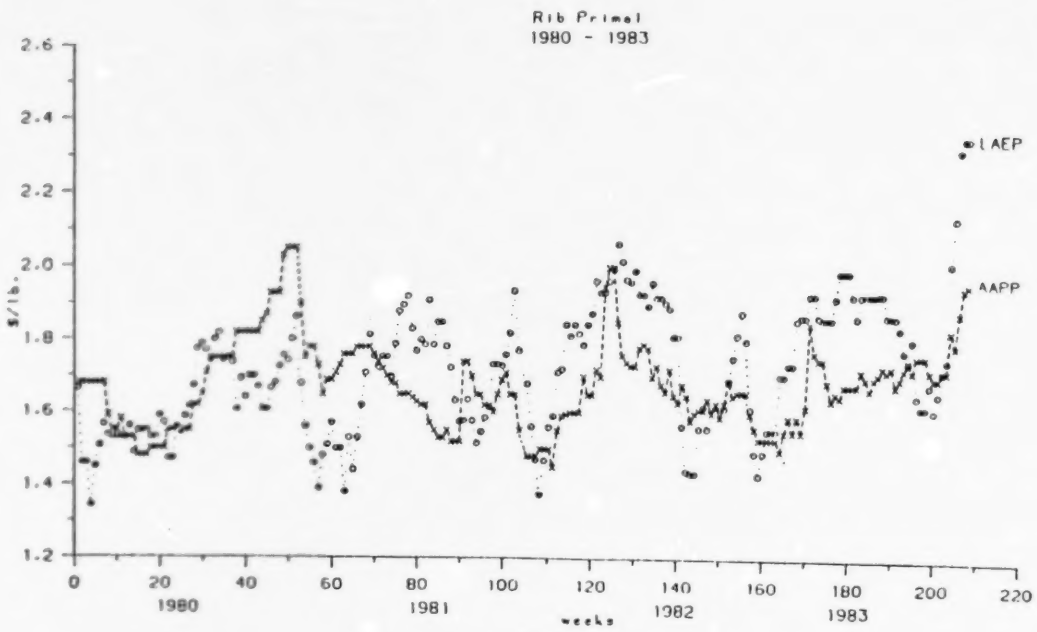
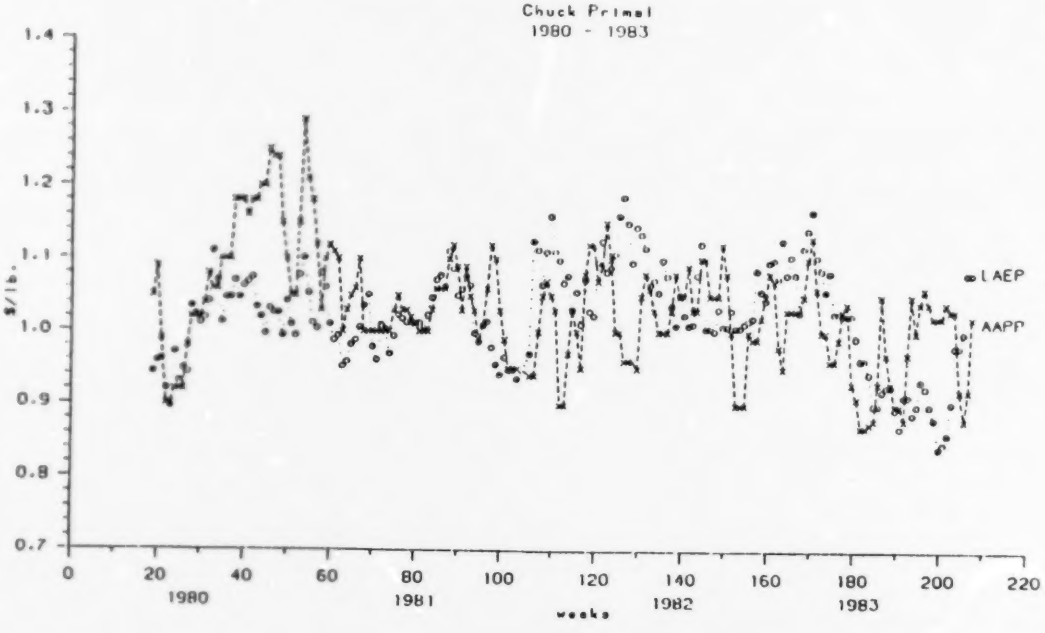


FIGURE 2



illustrate such opportunities are not continuous but rather intermittent lasting for only a few months at best.

Unlike many products then, even short interruptions can be very effective in limiting trade. For example, assume than an order is placed by a U.S. importer with a Canadian firm. The beef is slaughtered and cut to U.S. standards, inspected and certified fit for export to the U.S. by Agriculture Canada inspectors and loaded on refrigerated trucks. At the border the cargo is inspected by U.S. officials and, for the sake of argument, assume it is found unfit and returned to Canada. What is the effect on the Canadian firm? First the product which is returned will have been "hanging" an extra day or two and hence, as it is perishable, may suffer some decline in quality and will be discounted when resold back in the Canadian market. Further as the product is cut to U.S. specifications it will not be the exact product which Canadian wholesalers or retailers desire. Again the product will be discounted. The Canadian shipper will also incur all of the shipping, inspection and brokerage charges associated with moving the beef to the border and back. It only takes a few refusals for Canadian exporters to perceive the U.S. market as risky, with considerable costs being associated with attempting to ship product to such markets.

In addition the U.S. firms who have placed orders with Canadian exporters are left with insufficient product to fulfill their commitments and must find alternative supplies. Concerns over security of supply will likely lead U.S. firms to utilize non-Canadian alternatives even when Canadian product is favourably priced. Hence even short term interruptions can significantly inhibit trade flows over the long term.

How could short term interruptions be "arranged" if it is desirable? Border inspections provide an excellent example of how discretionary latitude arising from loosely defined procedures could be used to slow the movement of product. When a load of beef arrives at the border it is inspected by USDA officials. These officials have the option of doing a "full lot" or "skip lot" inspection. A "full lot" means that each package of, for example boxed beef is inspected. A "skip lot" means that only a selection of packages is examined. Clearly the probability of finding some regulatory violation increases if a "full lot" inspection is undertaken. Increasing the number of full lot inspections is likely to reduce the movement of product. In addition, inspectors have the option of rejecting only those packages which are found to be defective or they can reject the entire load if defective material is found. Again, if desired, more full loads could be returned.

There will always be a certain amount of commodity which will be defective. As beef is inspected and certified for export by Canadian officials before it leaves the Canadian plant, however, such faulty product should be minimal. Firms which export should be reasonably consistent in their quality control. Rejections of Canadian beef have ranged from less than one percent of total exports to almost three percent of total exports over the period 1976 and 1984 (Statistics Canada, 65-202 and Meat and Poultry Inspection, Report of the Secretary of Agriculture to the U.S. Congress, Annual). There appears to be an inverse relationship between the year to year movements of U.S. beef prices and the percentage of product rejected.

Border inspections are only one of the possible means available to close the border. Canadian packing plants are inspected for export certification by Canadian officials, with U.S. officials in attendance. If U.S. officials do not renew the plant's certification then the plant cannot export until it is recertified. As suggested above, incomplete paperwork can be a cause for rejection. For packaged products, labels must be approved before export can take place. The time it takes for approval is bureaucratically determined. The two systems of

measurement, metric and U.S., can lead to problems as can bilingual labeling for U.S. firms wishing to export to Canada. Regulatory changes for packaging, etc., could lead to delays while new packages are being printed or new machinery ordered. Changes in the regulations on drug or hormone use can cause short term disruptions when animals are already in the production process (5).

Basically, such barriers are only limited by the inventivenss of those wishing to apply them. The temptation to use such barriers is likely to increase if tariffs and more formal barriers are removed. As it is virtually impossible to anticipate all possible barriers of this type ongoing mechanisms need to be established to prevent their establishment or abuse. The goal of long run harmonization of regulations between the two countries should be specified in the treaty. In the short run, however, two institutions should be established to prevent non-tariff abuses. First an international commission should be established to which all levels of government - federal, state or provincial - would have to submit, for approval, any regulatory changes which would affect the beef industry. Such a commission would determine if the proposed changes would likely have significant effect on trade and determine whether they should be allowed.

To insure that existing regulations are not being applied unfairly some quick, on the spot, mechanism needs to be established to arbitrate any disputes arising from products prevented from moving between the two countries. The process needs to be immediate to account for the perishability of the product and the short term intervals of export opportunities (6).

The beef industry is less encumbered with domestic institutions which could affect trade than almost any industry in agriculture. There are no supply management marketing boards as in the dairy or feather industries or export boards such as the Canadian Wheat Board.

Grading is one area where some changes might be sought. Grading is basically only a means of quality assessment. The beef grading systems in the U.S. and Canada are different. Canadian beef moving to the U.S. cannot be graded according to USDA standards. Many U.S. firms in the retail beef and restaurant trade have invested considerable promotional effort and resources to associate themselves with only U.S. Prime or U.S. Choice product much as Canadian firms attempt to associate themselves with Canada Grade A. Such firms resist Canadian product because it can't be graded on the USDA system.

Further, the inability to grade by U.S. standards encourages the export of live cattle rather than processed beef. As any cattle, whether fattened in Canada or the U.S., if slaughtered in the U.S., can be graded by USDA standards. Hence there is a loss of jobs and value-added accruing to Western Canada.

In addition, there is an increasing preference for leaner beef in California. As Canadian product tends to be leaner than U.S. product, Canadian beef could be a preferred product in the West coast market. Canadian product must be labeled as such and hence firms which promote U.S. product tend to resist the use of Canadian beef. In the trade negotiations then, Canada should request that country of origin labeling regulations should be removed and that Canadian product which is destined for export should be allowed to be graded according to USDA standards.

To fully exploit the export market, it would be advantageous to deregulate the Canadian trucking industry. Commodity specific licencing authorities lead to problems of empty backhauls for those shipping beef and the resultant increase in transportation rates. Trucking of agricultural products in the U.S. has now been virtually deregulated effectively reducing the competitiveness of Canadian suppliers.

Finally, a California based market information system needs to be established. Many Canadian packers and processors utilize the wire service prices in Omaha as a proxy for the U.S. market. The California market is so large however, that prices on the West coast are only weakly related to those in Omaha (7). There is no readily available on line service in the California market. Hence to fully exploit the market, such a service needs to be established.

The beef industry in Canada receives different levels of support depending upon the programs of the individual provincial governments. In a trade agreement with the U.S., all subsidies need not be removed. The U.S. only desires the "level playing field". In other words the degree of subsidization on each of the borders should be approximately equal. Canadian subsidies tend to be direct and obvious making them easy for those in the U.S. to identify. U.S. subsidies in the livestock industry tend to be less direct and hence harder to identify. In addition, there are fifty states with separate and different programs as well as a multitude of U.S. federal programs. A perfunctory examination of a few states would suggest that subsidy levels are similar to those in Canada. An indepth examination of U.S. subsidies, state by state, is suggested. Only with complete information on such programs can Canadians negotiate on an equal basis. As yet no complete inventory of such information apparently exists.

If possible, attempts should be made to harmonize support levels across provinces. The U.S. will demand that its countervail powers be retained in any agreement. As the geographic origin of subsidized product cannot be identified, differing levels of support among provinces leaves the entire Canadian industry open to countervail as a result of high support levels in an individual province. In the post-agreement period any new subsidies will be closely scrutinized and the opportunities for market intervention somewhat limited.

Finally, if the Canadian processing industry is to be able to fully exploit the U.S. market and for the maximum value-added to remain in Canada, the agreement will require a long term non-abrogation clause. For a complete adjustment and to ensure the complete repayment of investments a period somewhat in excess of twenty years is probably required.

In summary, whether or not Canadian beef producers can successfully access the beef market on the West coast of the U.S. will depend on how well Canadians negotiate in the upcoming talks with the U.S. In addition, some changes within Canada will be required if the market potential is to be fully exploited. As a first step a comprehensive strategy needs to be developed by the beef industry as to how to approach accessing the U.S. market. One possible strategy is suggested in Figure 3 on the following page.

Members of the Canadian beef industry should also be willing to spend the resources necessary to make sure that they are as closely involved in the negotiating process as possible and to ensure that the channels of communication remain open to the negotiators. The worst scenario for any industry in agriculture would be to end up a "poker chip" because it was not prepared. Basically market potential exists on the U.S. West coast but accessing that market will take a lot of hard work and skillful negotiating.

FIGURE 3: A Canadian Beef Industry Strategy to Take Full Advantage of a Canada-U.S. Trade Agreement

TARIFFS

1) Negotiate removal.

NON-TARIFF BARRIERS

1) Removal of U.S. quota on beef.

2) International Commission to assess changes in livestock regulations with a trade context.

3) An immediate arbitration mechanism to determine the "fairness" of the enforcement of existing regulations.

INSTITUTIONS

1) Grading of Canadian beef destined for export by USDA standards and removal of country of origin provisions.

2) Canadian trucking deregulation.

3) Establishment of ongoing Canadian market information system for West coast markets.

SUBSIDIES

1) In-depth study of U.S. subsidies.

TIMING

1) Long term non-abrogation clauses.

FOOTNOTES

(1) For a more complete discussion of previous trade agreements between Canada and the U.S. please see Reisman, S., Canada-United States Free Trade, Speech to the Conference on Legal Aspects of Sectoral Integration Between the United States and Canada, Cleveland, Ohio, April 19-21, 1985.

(2) See for example Kerr, W.A. and S.M. Ulmer, The Importance of the Livestock and Meat Processing Industries to Western Growth, Economic Council of Canada, Discussion Paper No. 225, 1984.

(3) See for example Kerr, W.A., "the Livestock Industry and Canadian Economic Development," Canadian Journal of Agricultural Economics, Vol. 32, 1985.

(4) Those who wish to have additional information on the actual calculation process should refer to Gillis, K.G., C.D. White, S.M. Ulmer, W.A. Kerr and A.S. Kwaczek, "The Prospects for the Export of Primal Beef Cuts to California," Canadian Journal of Agricultural Economics, Vol. 33, No. 2, 1985.

(5) A more complete discussion of non-tariff barriers can be found in Kerr, W.A. and S.E. Cullen, "Canada-U.S. Free Trade - Implications for the Western Canadian Livestock Industry," Western Economic Review, Vol. 4, No. 3, 1985.

(6) For a comprehensive discussion of the operations of both the proposed International Commission and the arbitration mechanism please see Bruce, C.J. and W.A. Kerr, A Proposed Arbitration Mechanism to Ensure Free Trade Between Canada and the U.S. in Livestock and Meat Products, Discussion Paper No. 92, Department of Economics, The University of Calgary, 1985.

(7) For a more complete analysis of the relation of prices in the two markets please see Gillis, K.G., C.D. White, S.M. Ulmer, W.A. Kerr and A.S. Kwaczek, "The Prospects for the Export of Primal Beef Cuts to California," Canadian Journal of Agricultural Economics, Vol. 33, No. 2, 1985.

SHORT DURATION GRAZING
More Grass, More Profit

Bob Kingsbery
Kingsbery Communications
San Antonio, Texas

It's kind of ironic that you brought someone all the way from Texas to tell you how to make money with cattle. The most money Texans ever made in the cattle business came from selling cows to ranchers in Montana, the Dakotas and Canada.

That was way back in the 1800's. American and Canadian farmers had destroyed England's farming economy by growing wheat cheaper than their farmers could grow it. British investors thought we were going to do the same thing to their cattle industry and wanted a piece of the action. They spent today's equivalent of several billion dollars to buy huge tracts of land in the western half of the continent. Of course they needed cows to stock those ranches. Cows were the one thing we had plenty of in Texas.

It was the first time Americans were glad to hear somebody yelling "the British are coming"! Huge herds of cattle would be driven north in the spring and summer, just in time to settle themselves during the fall and die during the winter. Sure enough the British would be back next year to buy more cows. This went on for thirty years, until enough cows survived to build your own herds. A lot of Texas fortunes were built on blizzards in Canada and Montana.

There aren't any more easy fortunes to be made in the cattle business. The British aren't going to come back. Cattle prices aren't going to go up. Consumers aren't going to start paying more for beef. There isn't much money in cattle these days.

But there's a hell of a lot in grass. I came here to tell you about some people who are making a lot of money from grass. The people I'm going to talk about come from a lot of different places. They operate a lot of different ways. They have a lot of different goals. But they all have one thing in common--they are the pioneers of a revolution in grazing management.

I call it Controlled Grazing. Some call it Intensive Rotational Grazing. You may have heard it called the Savory Grazing method. The title of my talk is "Short Duration Grazing". The name is not important. Neither are the mechanics. Only the principles. And the results.

First of all let us establish a point of reference so we will be thinking along the same lines. For this purpose I am going to show you a picture of the most basic form of Controlled Grazing. It is a picture of a tethered cow. Remember the family milk cow we used to see tethered at every farmhouse?

Tether grazing is the most efficient form of Controlled Grazing. A tethered animal can only graze the grass within reach of its rope. It must graze to the owner's satisfaction before it will be moved to another spot. A tethered animal deposits all its manure where it grazes. Even more important, once the animal is moved it cannot return to its original area until its owner allows.

There can be no grazing management unless grazing livestock are under control. The better the control the better the management. That is how the term "Controlled Grazing" came into being. Of course there are not enough ropes and chains in the world to stake out all the cattle in Saskatchewan. It is, however, possible to "tether" your livestock with fence.

An extreme example of this concept is

this photo of cattle being given a strip of ryegrass and clover during the winter in South Texas, similar to early fall here in Saskatchewan. This strip is in the middle of a two and a half acre pasture planted to take advantage of our fall and winter rainfall. It is surrounded by native and improved range land that has reached the non-growing stage. Once a day the temporary electric fence is moved forward three feet and the cattle are allowed to graze the high quality forage.

By rationing the forage in strips this pasture provided supplemental forage from December to April. It cost $250. to establish the pasture. It took 30 minutes per day to move the fence and let the cattle in. The cost of haying during the same period would have cost over $2,000. and involved at least two hours per day. With Controlled Grazing the cash cost of supplemental feeding was reduced from $66. per head to $8. per head.

That's the main benefit of Controlled Grazing--cutting the cost of producing a grazing animal. It might involve reducing the quantity of supplemental feed, the amount of labor or the number of acres it takes to raise livestock. What it boils down to is getting more out of your ranch's natural resources. By "natural resources" I am talking about the things that you don't pay for. Such as yourself, your soil and the sunlight and moisture that falls on your place every year.

The most important of those resources is yourself. If you are tired of the cattle business and don't think owning cattle is worth the effort, nothing I'm going to tell you will change your mind. Depending on your circumstances, Controlled Grazing might require more labor or less labor. It may or may not require an investment in fencing. But it will require a greater awareness of the relationship between livestock and your forage. And a commitment to the business of raising livestock.

If you can't manage what you already have, doing it the way everyone else does it, there is no point in using Controlled Grazing. An agricultural economist with the University of California, talking about farmers utilizing new technology because the old technology didn't work, said it best: "There is no point in intensifying incompetence."

On the other hand, if you are dedicated to cattle as a way of lide and are willing to do the work and take the risks required to stay in the cattle business, controlled grazing will work beautifully for you.

Just as it does for Paul Eggert who ranches on the Eastern slope of the Rocky Mountains near Pincher Creek, Alberta. When Paul bought his 5,700 acre ranch a few years ago it could support 600 cows during "good" years. He put a pencil to it and decided the only way to make the ranch pay was to run yearling heifers during the summer. In 1983 he divided his place into nine section-size pastures and brought in 1,600 heifers. All the heifers were put in one pasture and moved when they had eaten the right amount of grass, about once a week.

The following year Paul divided the nine pastures into 22 and brought in 2,700 heifers--equal to three times the original stocking rate of the ranch. This time he moved the cattle every two or three days. His average daily gain was 1.96 pounds. He still wasn't satisfied. In 1985, coming off the driest year in the past 53, he divided his place in 34 quarter section paddocks. Each evening he opened a gate and placed a salt block in the fresh paddock. By morning all 2,700 heifers were eagerly eating the lush grass.

Because of the drought, Paul maintained his previous year's stocking rate of two acres per head. He still managed to match his previous year's daily gain. This year, if rainfall is normal, Paul plans to graze 3,500 heifers—four times the original stocking rate.

Increasing his productivity by 400 percent is only one of the benefits Paul Eggert has realized. One million pounds of manure are deposited on his pastures every year--approximately one ton per acre. Brush encroachment, a real problems for ranches in the area, has been reversed due to the extreme grazing pressure. The uniform grazing and long rest period have made the native grasses on Paul's ranch thicker and stronger than ever. No fertilizer or herbicide has been applied in the last four years.

Paul used high-power electric fencing to divide his ranch. He figures the 100 miles of fence it took to implement Controlled Grazing cost $20. per acre. Figuring the increase in carrying capacity, that's like buying three more ranches for $6.66 per acre!

Paul Eggert was trying to increase the number of cattle on his ranch. Most of you have all the cattle you want to own. In that case Controlled Grazing can cut your costs as much as it increased Paul's cattle numbers. Laurie Lasater's cattle operation in West Texas is a good example. He produces Beefmaster (a breed developed with Brahmans, Herefords and Shorthorns) bulls for commercial cattlemen. He knows how many bulls he needs and about how much they will bring every year so his main concern is producing them as efficiently as possible.

Controlled Grazing has allowed Laurie to manage 2,000 mother cows with four men and four pickup trucks. Each man manages an average of 500 cows on ranches averaging 7.500 acres in size. Each ranch is divided into at least 12 paddocks by high-power electric fencing. The cattle are concentrated in one paddock and moved when the forage has been grazed to the optimum length. Grazing and resting periods are determined on a daily basis and vary in length according to the time of year, recent rainfall and amount of forage.

By rationing the forage and planning ahead, Lasater's cows have good grazing two to three months longer than the neighbour's cows and can get by on a lower quality supplement during the winter.

Controlled Grazing allows Laurie Lasater to producer commercial bulls at a very low cost. I would like to add that Lasater operates totally on leased land and borrowed money.

Perhaps the most interesting thing about intensive grazing management is that it imitates natures way of managing grasslands. Before man intruded, ruminant animals such as buffalo grazed in close herds that moved slowly across the land. The grass was grazed short. Manure was deposited in large amounts. Millions of hooves worked the soil. Once the herds passed, the grass recovered quickly. Sunlight reached every plant. Rainfall soaked easily through the churned soil to the roots. Vigorous organic activity turned the manure into valuable nutrients.

For millions of years nature maintained the great prairies of the world without the help of range scientists. Millions of grazing animals thrived, year after year, with no supplemental feeding or improved grasses. The thick mat of roots kept undesirable plants crowded out. Insects such as grasshoppers were kept in check by lack of open breeding ground. All sorts of wildlife thrived due to the wide variety of flora. Springs, fed from water absorbed by the soil, kept streams flowing year 'round. Topsoil, the foundation of all life, was created--millimeter by precious millimeter.

Then came modern man. With his concept of property lines and his ability to change the environment. We put fences around our livestock, forcing them to graze one area continuously. They grazed the most palatable grasses again and again, allowing them no time to recover. Eventually the hardy native grasses were grazed out, making way for brush and weeds. As the quality of forage declined we were forced to plant

non-native grasses. The seasonal qualities and poor nutritional value of these "improved" grasses required longer periods of supplemental feeding.

Livestock production, once a low tech occupation requiring only animals, cheap land and human labor, became a high tech farming operation requiring machinery, irrigation, skilled labor and large amounts of capital. In the last three year the cost of modern production and the price of cattle have converged, making conventional cattle management a break-even or worse proposition.

Controlled Grazing is a resource-intensive method of management, it works wherever grass grows and livestock graze. By whatever name, it has made raising cattle in marginal areas profitable for ranchers throughout North America. However, the greatest potential for making money with Controlled Grazing exists where grass is most abundant. Almost every livestock operation has some high-producing pastureland. Maybe an unused field, some fertile bottomland or cropland in seasonal production. This is prime Controlled Grazing land.

Ron McBee owns a 120 acre farm in central Missouri. At the time he bought the place it looked like land and grain prices were going to keep on climbing. Three years ago the bubble burst for Ron. Like it did for thousands of other farmers. He had two choices: make more money or lose the farm. Rather than try to grow his way out by planting more seed, applying more fertilizer and herbicide and hoping the government would increase support prices, Ron decided to graze his way free.

In 1984 he divided half of his farm into 12 paddocks with temporary electric fencing. That first year he increased his production of beef with stocker cattle from 88 pounds per acre to 148 pounds per acre. That wasn't good enough. Last year he increased the number of paddocks to 31. His beef production almost tripled, to 424 lbs/acre. McBee moves his stocker cattle into a fresh paddock every day. He allows them to graze the fescue and clover mixture to just the right height before moving them again. Remember the tether grazing principle?

Each paddock averages 30 days of rest between grazings, giving the forage plenty of time to replenish itself. McBee has applied no fertilizer or herbicide. He has used no equipment or fuel on his farm in the three years he has been Controlled Grazing. He uses the undivided half of the farm as a back up pasture during the slow growing summer months, something he strongly recommends for people starting out.

McBee also recommends using temporary electric fencing to divide small acreages. This allows experimentation of paddock layout and size. He first tried a wagon wheel layout with the water in the middle but ran into bogging problems during the wet months. He has now gone to rectangular paddocks with a narrow water access lane. The results? Last year he produced a net profit of $150. per acre from cattle and grass. He says he is still learning and will increase his beef production by 50 percent this year!

At this point many of you probably want to know why Controlled Grazing, if it is such a great idea, wasn't being used before. I had the same questions when I first heard about it. After traveling two thirds of the way around the world twice, spending the past seven years asking questions and doing a lot thinking, I finally came up with some answers.

Until recently we didn't need to increase our efficiency because land was so cheap. Twenty years ago if we wanted to make more money from cattle we simply bought more land to raise more cattle. Until ten years ago the increasing consumer preference for beef kept up with the supply, insuring high cattle prices. Inflation gave us increased borrowing power to offset the

occasional crunches. The government subsidized cattle production by paying for range improvements, sponsoring research, building highways, financing rural electrification and establishing quotas on foreign meat imports.

For the first 150 years we had the free use of native grasses, compliments of the previous 10 million years of unmanned grazing management. On top of all that we had cheap labor, energy and interest. There was very little we could do in those days to lose money, at least on paper. Nor was there any reason to do anything different from our neighbors.

In New Zealand Controlled Grazing is practiced by almost every livestock producer. That country's economy is based on the export of wool, red meat and dairy products. Their biggest market has always been England. In the early 1960's England announced it would join the European Economic Community, or Common Market, in 1973. New Zealand farmers knew they would have to produce their livestock products much cheaper in order to compete with non-tariffed products from the Common Market countries.

A crash program funded by the New Zealand government and private industry, began looking at new techniques and technology to increase the efficiency of livestock production. Intensive management of forage showed the greatest promise. Researchers found that dividing grazing land into smaller paddocks and concentrating livestock forced them to utilize more forage. Giving the animals fresh forage every day or two increased their productivity. New varieties of grasses and clovers, designed to grow at different times of the year, were developed to provide feed all year long. The concept of matching rest periods to grass growth was perfected.

Some of the greatest advances in grazing technology were made in the area of fencing. Dividing pastures and concentrating livestock requires very effective, yet inexpensive fencing. New Zealanders developed a completely new kind of fence called Power Fence. It is electrified by high powered energizers that can charge several miles of fence. Power Fence is used for permanent as well as temporary fencing and costs half as much as traditional barbed wire fencing. But more important, Power Fence controls livestock well enough to make Controlled Grazing work.

Thanks to all the research and effort, New Zealands's livestock producers are the most efficient in the world. The cost of land, labor and energy is higher in New Zealand than it is in North America. New Zealand farmers receive only one-half to one-third as much for their livestock as we do in North American. Yet they make money every year and enjoy a high standard of living. To give you an idea of how important Controlled Grazing is in New Zealand, a farmer there is considered a bad manager if he has fewer than 20 paddocks.

Controlled Grazing is being accepted in North America today for the same reason it was developed in New Zealand 20 years ago: economic necessity. That's a polite term for "scared as hell". Let's face it, no one wants to change what they are doing unless they have no other choice.

Tim Harkness reached that point three years ago and took the Controlled Grazing plunge. He built a 13 paddock grazing unit on a mesa in northern New Mexico. Each June his cows, calves and yearlings go onto the divided pastures. During the four month grazing season the yearlings gain 300 lbs. from the well managed grasses. In September the yearlings go to feedlots and the cows and calves go down to winter range.

Harkness had to overcome a strong personal skepticism about Controlled Grazing. Primarily because, in his own words, "the university people were dead set against it and I mistakenly thought they were smart people and knew what

they were talking about." Luckily he found out for himself what a lot of other ranchers have discovered: Controlled Grazing works for those who want it to work.

Like all practitioners of intensive forage management, Harkness found out early that Controlled Grazing is not rotational grazing. You don't move cattle by a calendar because grass doesn't grow by a calendar. You can't arbitrarily decide to move your livestock every third day. During periods of rapid growth livestock should be moved rapidly, to keep up with the grass. During periods of slow or no growth, livestock should be left in each paddock longer, to give the grass in other paddocks more time to rest.

Paddocks will vary in size and in the quantity and quality of forage. The number of paddocks is irrelevant. We are interested only in the length of time each paddock is rested. Let's say the optimum rest period is 30 days and the average grazing period is three days. We must have at least 11 paddocks. But that's only an average and there's no such thing as an "average" year. So we would be better to build 16 or 20 paddocks to compensate for the bad years.

If you have more than one herd you can run them in the same grazing unit, as long as one follows the other. In many cases stocker cattle can graze ahead of cows during the growing period. The younger cattle eat the better part of the grass and the older cows clean up. Sheep and cattle mix well together since they are on different diets. The cattle eat the forage, the sheep eat the forbs. A seasonal Controlled Grazing stocker operation is probably the most profitable type of livestock operation for this part of the country.

I believe Controlled Grazing offers livestock producers in Saskatchewan a tremendous opportunity to convert grass into money. All it takes is an appreciation of the value of livestock and grass. And an understanding of how to manage both to the benefit of each other. No one can tell you exactly how to manage your particular grazing resource. Controlled Grazing is more an art than a science. Just keep in mind that good artists have always made more money than good scientists.

I hope I have given you a better understanding of what I think is the most exciting innovation in the livestock industry. I believe Controlled Grazing, or whatever you want to call it, is capable of changing the cattle business completely. It can increase our profits, at the same time reduce the price of beef to the consumer. Controlled Grazing can improve the quality of our grasses and increase the value of our land. It can reduce disease and parasite problems among our animals.

Best of all, Controlled Grazing will allow us to get off our tractors and out of our pickups and get to know our land and our animals. We may not get rich or famous, but we will be doing work fit for a man. As Laurie Lasater says, "I don't know many ranchers who want to be doctors or lawyers. But I know a lot of doctors and lawyers who want to be ranchers".

I want to conclude my talk by paraphrasing a wonderful quote by Jonathan Swift: "Whoever can make two ears of corn or two blades of grass grow where only one grew before, deserves more credit and does more good than all the world's politicians put together."

Thank you.

QUESTIONS AND ANSWERS

QUESTION: In your talk you stress the importance of the rest period for the grass and also talk about 3 to 5 days as the longest time to leave cattle in one paddock.

ANSWER: Yes the number of paddocks isn't as important, it's not really

relevant. What you're interested in is the length of time each paddock is rested. Lets say an optimum rest period is "30 days". That's how long it takes the grass plant to recover, once it is grazed. After three to five days that plant that got grazed down is starting to do a bit of regrowth - which is pretty tasty to a cow.

But, the regrowth is not from sunlight at this stage - it's from root reserves. The plant is in a delicate stage, depending on those root reserves. If the cow continues to come back and graze that plant - which it will if its still in the same paddock - it will rapidly use up the root reserves - you start losing plants. The plant needs the rest period to replenish root reserves.

At the same time the animal is waiting for the tender shoots to grow it is ignoring other plants that are not as tasty; they mature and become even more unpalatable. So you lose productivity.

Optimum rest period changes with the plant environment. When plants are recovering faster i.e. spring, fast growing, then rest time is shorter than when the weather is dry and the plants are growing slower. You have to rotate by the plant not by the calendar.

QUESTION: What more do I need to know or is it just se simple that I can go home and apply just what I've heard here about controlled grazing in the past hour?

ANSWER: Yes and no. It is simple. I was so worried about how simple it was or how difficult it was I probably spent a lot more time on the road and talked to a lot more people than I should have. Alan Savory explained the whole thing to me and got me really excited about it. I talked to some New Zealanders and they got me more excited.

Eventually it got back to Al and I having a conversation and I said "Alan, you know you divide up all your pastures and you get out and put your cattle in one herd and you move them around and everything else. It's going to double your income because you're going to be out there everyday looking at what you're doing". The important thing is if you get out and really look at your grass and your livestock for the first time and get a control of them. Everywhere I've seen it, somebody just had to go out and start doing it.

QUESTION: What happens when you get into a situation like we were in the past couple of years where you had virtually no regrowth?

ANSWER: When you're out of grass, you're out of grass. I'll tell you what Laurie Lasater did. They had about a two and a half year drought in west Texas. He had two grazing cells next to each other. One was 16 paddocks and one was 17 paddocks. So, when it quit raining, he said, "well I don't have any choice. I'm leasing this land. I borrowed money for the cattle". He combined the two places. He had 31 paddocks. He figured that with the amount of grass that was still there if he managed it very carefully, he could run that herd through there three times for the 31 paddocks with three days for each paddock for a total of 270 days grazing. He figured he'd either have some grass or be out of the cattle business. It did rain a little bit but, he had grazing for about 12 months longer than his neighbours did who were continuous grazing.

In the same drought in South Texas, a rancher who had a controlled grazing system, one of the first in the area, told me "Well, you know, I'm ranching next to a guy who's considered one of the best ranchers in Texas. He had one big pasture out there and when he ran out of grass **he didn't know it** and his cows started dying. He couldn't find them, they weren't concentrated, he couldn't get them out, he lost money. I knew to the day because of my grazing management when I was going to be out of grass and moved them to another place. I didn't lose any and didn't have to sell any." With controlled

grazing you know when you're going to be out of grass a lot longer than before anyone else knows. It will last you longer but you'll know when you have to make that decision. Like I said - when you're out of grass, you're out of grass.

QUESTION: How many interested people would it take before Stan Parsons would hold a school here in Saskatchewan?

ANSWER: I believe he would like somewhere in the vicinity of 20 to 25 people to attend the school.

QUESTION: I'm interested in the concept of running two or three different herds, one right after the other. When that one batch of cattle are done if you're running say 20 paddocks is there enough grass for the second and third herd right behind them or how do you do that?

ANSWER: Well, that's again up to you. You have to manage if for that reason. Usually when you're running yearling cattle through there you're just maintaining your cows during that same period, just keeping them in body weight. So, you let the yearling have the best part. If you normally had just one herd you'd let them graze three days. You just double that. You go two days per herd. In other words let the yearlings graze two days and let the cows sort of follow along. You don't have to double the number of paddocks you have when you've got two herds or triple it when you've got three herds, you just have to add one extra paddock per herd to give you the same amount of rest period because they're going to keep moving around.

You can also alternate. It gets pretty interesting when people try to keep two breeding herds, one bull in one group and one bull in another group and keep them apart. You can't have them next door to each other no matter how good your fencing is. You've got to have them separated. People start doing these zigzag things to try to keep them apart but the herds follow each other back and forth rather than round and round. But, again it goes back to the fact that at least you're out there looking and seeing and thinking.

QUESTION: One of the things that concerns me about this controlled grazing is the labour involved. I hardly have time to go out and check my cows once a week when I'm letting them run all over the place let alone go look at them daily. What changes in management have to take place in order to make the time?

ANSWER: Well, I didn't mean necessarily daily. It gets down to the point where you have to decide. Once you get control of your livestock and exploit that relationship you can do a lot of things. Set it up so you can do it once a week. Just have enough paddocks and make it work. Have somebody go out and do it. It gets back into are you in the business of trying to occupy your day all day long or are you in the business of trying to make a living and make money out of your investment in land and cattle?

You have to get control of your resources before you can make those decisions; it's going to have to be individual. I can't show you how. I can't tell you how to do it. I can't do it for you and neither can anybody else up here. It's going to have to be something that you go out there and evaluate your time and your return on labour and everything else. I was just talking to a lady here that's got seven paddocks and she moves every two weeks and she's making it work so maybe that'll work, too.

QUESTION: Assuming that I had a pasture now running 100 cows. Let's say I had controlled grazing system this coming season, how many cows could I feasibly run on that? Could I instantly double it or how long does it take to build up to where you're at the double what you were before?

ANSWER: I couldn't say exactly but I'll tell you this. I've never been on a place that it doesn't work, with at least a 50-100 percent increase in

livestock. Because you've got cattle out on a big continuous pasture usually if you divide it you don't have enough cattle to eat that grass down in the period of time that it takes. A lot of universities in the United States, divided their grazing up just like they were supposed to do and everything else, and they said "Well, we don't think we can double our carrying capacity the first year. We're just going to up it 25 percent or maybe 50 percent" (really get risky), and they didn't get the utilization of forage and they didn't get the regrowth that they wanted. They didn't get the management of their forage that they wanted. So it simply didn't work for them (as they said it wouldn't). One of the reasons that it didn't work was that they didn't have enough cattle out there.

I'm not saying the main reason for doing this is to double the number of cattle that you have because a lot of you have more cattle already than you want to mess with. But, if it's planned right and you have a so-called normal year, similar to the one you had last year and the one you've been going through, I don't see where doubling or even tripling is a problem that very first year.

Don't take it all and put your whole place into it. Take half of it, divide it up and then you've got that other range out there as a back-up pasture if you do have a low year or when you're learning your grass. We've got to learn your grass to make this work.

QUESTION: I was just wondering about the dimensions of the paddock, whether there's a minimum width and a maximum length because the cattle will only go so far in a day?

ANSWER: We've had problems any time they had to walk more than 3/4 of a mile. They just don't seem to get to the back there. I like to utilize existing perimeter fencing and try to develop from there. The best way to start out, when you start over, is just take the perimeter, whether it's a pasture or your whole ranch, forget everything exists, and divide it and see what works best taking your watering points into account like tanks and windmills and things like that. But, don't try to get paddocks more than half a mile to 3/4 of a mile in length because cattle won't walk that far.

QUESTION: What about minimum width?

ANSWER: Some of those paddocks we saw at one place were 60 acres divided into 31 paddocks so the paddocks were 30-50 feet across. One thing is important. When you're building your lanes whether they're access lanes or around working areas, don't build them any winder than 20 feet. Those are the areas where you don't want your cattle to stay because they will stay and lie down around windmills and things like that. As long as you're not bogging up and having problems like that I don't really see where you can get too thin. One guy in North Dakota had a place that was divided by a railroad. They were running the train once a week, so he just incorporated what he calls the long paddock, the railroad, into his controlled grazing cell. I'm just saying that you need to look at your place and decide how many paddocks you want to manage. I don't think there will be any problem in getting them too thin. The squarer they are, the better utilization you're going to get.

QUESTION: What if you've already got your system set for rotational grazing: crested wheatgrass for spring, majority of your range is native grass, then perhaps Russian Wild Rye for fall. What would you do? Use the native grass and just the native grass under controlled grazing?

ANSWER: You can incorporate both improved and native range in the same system as long as you keep the amount of grass equal. Remember we're not interested in paddock size. We're interested in the quantity of grass in each paddock. If you've got some grassland where there's some improved

grass, better drainage or better soils you could utilize smaller paddocks than you would in the areas that aren't growing as well. Maybe start out in the improved grass first and use your native range as another paddock. Bring them in to the improved grass, strip graze it, whatever you want to and then you can turn them out on your native range. The important thing is keep the amount of forage as constant as possible. Your paddocks are going to vary in size. They're not going to be square or exactly equal.

QUESTION: Supposing you have some really rough rangeland and a big acreage along a river where you've got some real rough hills and it just seems unfeasible to put a fence up that stuff. Would you just comment on that?

ANSWER: How rough? We're talking about trying to increase our return on investment in this business. I don't mean just the amount of money you have invested in land and equipment and everything else. I'm talking about your time. I guess the best answer is you can use controlled grazing anywhere grass grows and livestock can graze. If they can get there, you can utilize controlled grazing.

QUESTION: Are there any publications on Controlled Grazing?

ANSWER: Yes, there are three you might be interested in.

The New Farm
222 Main Street
EMMAUS, Pennsylvania
U.S.A. 18049
Canadian Subscription - $19. US

Grass Farmers' Journal
Highland Village
Suite 207 - 4500 I-55 N.
JACKSON, Mississippi
U.S.A. 39211
Subscription - $18 US
Foreign - ?

"Controlled Grazing Times"
Kingsbery Communications
13235 Staviock
San Antonion, Texas
U.S.A. 78248

"WE CAN MAKE A DOLLAR RAISING BEEF"

JOE WILLMOTT, CHIEF EXECUTIVE OFFICER AND GENERAL MANAGER
W-W MANUFACTURING
Nanton, Alberta

Putting together into a nice capsule everything we've talked about over the last two days is a tough job. We can make a dollar raising beef! I believe that; I really do. We've come through 25 years in the post-war period of unprecedented growth in the beef industry, easy money especially in the late 60's and early 70's. But its all changed and we can't just wait for the sun to come out. We've got to change the way we've been doing things, look at a lot of new technology but the real solution is the guy in the mirror. There is no magical solution, you have all the answers right now. Each and everyone of you can make a profit next year or the year after in the beef industry if you simply do the right things and direct yourself on the right course of action.

I'd like to read the two little paragraphs on the inside of the brochure for "What's In Stock For You? 1986".

"It is time for some optimism in the beef industry. Lets stop waiting for things to turn around **next year**. Lets look at what can be done **now**. Sure, times are tough. Maybe even tougher than they've ever been before.

"The question is, how can you as part of the beef industry be more efficient, more competitive, more profitable, in spite of the situation? Can you turn these difficult times to your advantage? "Efficiency", "competitive", "profitable" are the moving targets of every business. There is a dollar to be made raising beef if you use available technology, seize available opportunities, meet market demand, turn the constraints to advantages, both as an individual beef producer and as a member of the beef industry."

It's time we got off our butts, if we want to be in the beef industry. Ask yourself this question 'Do I want to raise beef?' If the answer is 'yes' -, then ask yourself 'Do I want to raise beef profitably?' I always wanted to be in the feedlot business. We had a successful Red Angus herd, three time National Champion at Denver, a sale that broke all records. I thought I was invincible so we went into the feedlot business, never even considering whether it was a **profitable** venture - we just bought it. We got out of it two years later - nothing against the feedlot business - **we** did it **wrong**. We could have done the same thing at the same time and still been in business if we had done it **right**.

We've heard a lot of things that are wrong with our industry - problems to overcome, hurdles to jump. But if you listened to what the speakers were saying, you can't help but get excited. There's so much we can do that we haven't tried. We've been too steeped in "negativism". I'm an eternal optimist. Next time someone gives you bad news say "That's good!" While they are being astounded because you're obviously unaware of the problem, you can be **thinking** and find something good about it. You'll be able to redirect your course of action.

Don't say "Goodbye, Fred, take care". Do the guy more of a service, give him some good advise "Goodbye, Fred, take a chance!" We need to change our attitude. Our state of mind is the biggest problem affecting the beef industry today.

If you believe you can't make money in the beef industry, that's exactly what will happen - you'll go broke. Then you can join the rest on coffee row that are saying 'it's terrible,' 'we can't do it' or 'the government should do something'. Instead of reading in the newspaper how bad things are, how

many cows are gone, how many guys have gone broke, think 'What can I do here, at home to make my beef enterprise pay?' 'What different approach can I take?'

We've heard a lot of negative jokes about the beef industry and we all chuckled. But a steady diet of that stuff has an insidious effect. You start believing it and lose your enthusiasm. Why do anything, why see the banker, why put in a grazing system - there's no money in it. Then you better ask yourself why are you in the industry.

A negative mindset causes us to do things differently than if we had an optimistic attitude. I read a book on **the Study of Psychocibernetics** written in 1964 by a plastic surgeon who studies patients with physical disfigurements before and after their plastic surgery. It was written long before motivational speakers. The book very concisely helps you understand how you can change just by **believing** you can do something, and how your output, activity and relationships with others can be affected just by being negative.

Ed Duren had a good attitude. He told us how we could get into the business of adapting technology, how extension people should get information to the people. He mentioned they were only 30 percent successful in getting information from the laboratory down to the farm. He stated that the U.S. cow herd operated on a 70 percent efficiency. I think Canada's about the same. There's a long way we could go, there's tremendous opportunity for advancement. Ed said there are people making money. He's seen well operated programs and he's seen people who are generating a profit. I think this room is full of people like that.

There are people here that I know personally who have overcome tremendous adversity, pulled themselves up by their boot straps and got the thing going. Ken MacDonald has rearranged his feedlot operation and now is working in a viable venture. T Four Ranch readjusted their program to meet the economic conditions they were faced with and now are running a profitable venture - Jim Hampson and Lynn Biggart started out no different than anybody else; they didn't have anything given to them and now are operating what I would consider agribusiness. I asked Jim Hampson "Tell me the truth, Jim, are you making money in the cow business?" He said "Definitely or we wouldn't have them".

Another example is past president of the Saskatchewan Stock Growers, Neil Jahnke. He bought his ranch in 1972, and managed to pay it off in 10 years through some of the roughest price ranges we'd ever seen. Neil did it by simple perseverance. He's got one of the most well run operations I have ever seen. Every nickel and dime is accounted for. Every program is thought out. Their grazing is thought out. Their cross breeding is thought out. Their bull selection is thought out. They didn't spend a lot of money. He's scrimped and he's saved and he's made it go and now he's going to start to reap the rewards. His cost of production is low. At $84 a hundred weight, he can make money and a lot of people can't.

The people who know their production costs can control their production costs. Saving money is like making money. It's something you have direct control over. Harlan Ritchie talked about how important cow efficiency is. He stated calf weight at weaning is important but you have to look at cow size relative to productive efficiency and feed consumption to get at the bottom line. It makes sense to do that. If you're going to run a total program you should understand what the costs are and how they relate to one another.

It sure changes my thinking on cow size. At first glance, the statistics make bigger cows look better but with efficiency data, maybe we should rethink that and look for more conventional crossbreeding. Dr. Ritchie stated that a constructive

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cross breeding program with some design would increase efficiency about 25 percent. I was told there was 100 percent income difference between the poorest and the best managed cattle operation. The beef industry is exciting because you have the capacity to improve productive efficiency on a given acre of land by engineering genetic improvement. You can do it, yourself.

But, there are a lot of things you cannot control. Things that happen in politics and world trade. Charlie Gracey stated that the market is saturated and I think that's right as we see it right now. Cow numbers are declining. People are leaving the business because of hard economic times. We're getting heavy duty competition for pork ad poultry. Countervailing duties are causing problems in pork.

But, there is a lot of good news if you turn it the other way. He's described the options market, that maybe we could look at using. We don't all need it or we may not all use it but at least it's an option for us. He stated that packers may be getting into shared risk programs to attract business, because of our declining supply. Instead of trying to get the cattle at the lowest possible price, they're going to maybe work with the producer. He stated that the declining cow numbers and a reduction in feeder cattle are going to mean that there's going to be a feeder cattle seller's market for the foreseeable future - three to five years.

Bill Grey described our heifer kill and how historically high it was. If we suddenly stopped our heifer kill, decided we're going to stay in business and started replacing our basic herd, you'd find you short changed the market 15 percent over night. That would have some tremendous impact on our selling price. We hope it doesn't happen that fast but it's a potential. The only reason we have as much supply going to our market as it is right now is because we're killing off all our females. We can't produce for the demand that we have right now.

The market is only saturated because we're reducing our inventories. In the business I'm in, if we decide to dump a million dollars worth of inventory on the market, right tomorrow, regardless of price, we're going to saturate the market. Everybody can buy panels and gates probably at 50 percent off. The market is saturated because of the beef sell off. We're losing numbers and that's got to have a positive impact on our industry down the road.

Gordon Pugh stressed the importance of trade. He told us there was a $770 million advantage for us trading with the United States. Bill Kerr stated that access to the California market was possible if we only did it right. It means a 20 percent expansion of our market immediately if we could access it. There's some problems with trade but I hear certain farm organizations out there are fighting against free trade. For what I don't know. It's obvious to most that we need to generate activity. We cannot produce for 25 million people and expect to survive when we have such abundant natural resources. We have to tap into other markets. If we create activity, we're going to have jobs.

Gordon Pugh told us about the situation with the EEC. We can be pessimistic and say they'll spend their way to oblivion and keep subsidizing their beef from now to eternity. But, I don't think that makes a whole lot of sense. They embarked on their present agricultural program to encourage self sufficiency because they had no agriculture after World War II. They have succeeded in doing that. Now they've got surpluses. What they are doing is perpetuating the surpluses and that's economic insanity.

How long are they going to be able to keep that up in any sustained way? How long are they going to be able to keep subsidizing exports when all their local people are paying at this price and Russians and North Americans and

whoever else is paying way down here? People won't take that forever. They will not willingly give up their tax dollars to subsidize people in foreign countries so they can eat cheaper. That has got to change. It will change. A change in GATT preventing subsidization of agriculture exports will have a profound effect on world beef trade. We must get into free trade, that's imperative! We in the beef industry have got to convince other people about free trade. We have all kinds of people picketing and fighting against it and how it's going to cut jobs out. They don't really understand that without free trade we're going to collapse upon ourselves. We need to have economic activity. If you go back to the 30's, what caused the world wide depression was the shut down of all trade. We quit trading with one another. The money never evaporated to Mars or Venus or someplace like that. It was always there. We just quit circulating it.

Trade is a two way street. We've got to bring in as much as we send out. Trade creates economic activity and economic activity creates jobs, jobs create spending and spending creates gross national product. The more activity we have the more chance there is for us to rake off the top.

Bill Grey yesterday told us how to adjust our production and selling patterns to take advantage of high points in the market. Maybe we could look at calving in January as he stated so we can get our cattle out of the dead market in the second half of the year. Most people won't. People are slow to change. But, you have the advantage.

Bill Farr, had a good outlook for the industry if you could read between all those lines. He thought that retail demand would increase. NCA are going to be able to generate a lot of money to advertise beef. As much money as some of the major corporations are to advertise toothpaste and all those other consumer items. We've got to go head on head and create an appetite.

He stated the U.S. government will be putting pressure on the EEC to rationalize their trading practices. Again, he stated the importance of trade. I think if we go through this whole program these last two days, there was one thing that was stated, we need to trade.

Dr. Bell told us that the bad publicity about beef and cholesterol has been refuted, he showed us examples and how the information should be portrayed and not how it is in the medical journal called Readers' Digest. He stated that in one major study that has been widely publicized showing the reduction of cholesterol had had a direct effect on longevity or healthy life has been questioned by 17 prominent scientists. He showed us that the human body needs vitamins and minerals that can only be found in red meat.

If you ever look at your teeth, we're meat eaters - always have been; always will be. That's the way we developed if you believe in evolution. The veterinarians say we're not supposed to harm these other animals. I don't know where they get it because if you look in traditional religion, you can't find it. It's a fad.

I think there's a move toward conservatism in our lifestyles. In fact, in New York it's becoming trendy to go out and have steak or buy meat and potatoes. It used to be that you want to eat vegetables and salads and quiche and pasta. But, people are moving back to eating meat. Steak houses are starting to resurge in popularity. We can look at trends and people are looking for traditional values. We've gone through the swing of the 60's. We've gone through the credit binge of the 70's and now we're getting back to basics in the 80's. That's exciting !!

Carolyn McDonnell explained the BIC program. It's exciting to see how we're getting our message out in the same glossy packages as Ford Motor Co. presents their cars. This kind of technology and advertising is something

they understand. It's portraying beef as being exciting and trendy for the yuppie generation. If you tell somebody something long enough you can create a demand for it. There used to be an old adage in rock stations: 'play God Save the Queen enough times in the Top 40 and it would be a Number One'. Repetitive advertising, getting the message across, will create a demand. All we need to do is increase the price by one cent a pound and the dollar spinoff was phenomenal.

Ab Gorrill's discussion on electric fencing was timely in light of what Bob Kingsbery had to say to us and having the display out there. Electric fencing in western Canada was never a great big thing. It sure was in eastern Canada, but the technology since I've had anything to do with it say 15 years ago in comparison to what it is now, has certainly improved. Bob Kingsbery got a lot of questions. There must be a lot of people interested in rotational grazing. We can do twice as much on half as much land, just by applying technology and getting into intensive agriculture instead of extensive. When we used to expand we bought more land. It was cheap. It was never ending. Now we don't have the land. It's too expensive. We've got to make the most of what we've got right now.

Land ownership today is an investment. A cattleman traditionally takes care and raises cattle. He doesn't necessarily own land. Land ownership is really a feed input. So, if you can buy feed cheaper than it is to pay the interest and taxes, etc. maybe that's the way to go. In fact, in Europe very few farmers own land because it's been an expensive commodity for centuries because there's been none of it.

Get behind your industry. Join a Cattlemen's Association and participate. If you join a Cattlemen's Association, you do have griping rights. If you don't you lose all your griping rights. We've got to work together with one another. We can't just suddenly say 'well we need the government to hunk in a whole bunch of money to solve all our problem' because the more money you put into an industry the worse it gets. Look at the EEC! I'm not against subsidies but I think we've got to look at rationalizing our industry. Solve our fundamental problem, which is world trade. I tried to bring it all together to a central theme. Yes, we can make money raising beef. I believe that as sure as I'm standing here. There's lots of things we can do. I think each and everyone of us can advance our program substantially. If you don't want to or you don't believe it I would suggest you get out and do something you would enjoy. The main thing is you have to want to succeed. If you don't want to succeed you'll never succeed.